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modernAKIS Together for Systems' Innovation

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List of abbreviations

AKIS	Agricultural Knowledge and Innovation System
CBs	AKIS- Coordination Body
BT	Benchmarking Tool
BT WG	Benchmarking Tool Working Group
CAP	Common Agriculture Policy
CAP-SP	Common Agriculture Policy-Strategic Plan
EC	European Commission
EIP-AGRI	European Innovation Partnership for Agricultural productivity and Sustainability
EIP-OG	EIP-Operational groups
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FBO	Farmer Based organisations
FTE	Full Time Equivalent
GDP	Gross Domestic Production
MS	Member State
NGO	Non-Government Organisation
SCAR	Standing Committee of Agricultural Research
WP	Work Package

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1. Executive Summary

The AKIS Benchmarking Tool (BT) has been developed within the Horizon Europe project modernAKIS to support Coordination Bodies (CBs) and other key actors of change in understanding, diagnose, and improving the performance of their Agricultural Knowledge and Innovation Systems (AKIS). The BT addresses the need for a structured yet flexible approach to diagnosing AKIS functioning, tracking progress over time, and facilitating strategic learning. The BT rests on three core aims:

1. Self-diagnosis and system awareness, providing a comprehensive picture of the AKIS and its components.
2. Internal benchmarking over time, enabling yearly track of changes.
3. Cross-country comparison and learning.

The conceptual framework of the BT is structured around five dimensions which contribute to the well-functioning of AKISs, being: 1. actor diversity and constellation of knowledge infrastructures, 2. strength and diversity of advisory providers, 3. coordination arrangements for actor collaboration, 4. policies and funds available for supporting AKIS and 5. linkages and interactions between actors.

The set of indicators supporting the assessment of these dimensions was developed through a stepwise approach involving desk research and co-creation process with the Benchmarking Tool Working Group (BT WG). The development accounted for definitional differences across Member States, data availability issues, and the need for adaptable indicators at both national and regional levels. The resulting output consists of a benchmarking framework for AKIS, a set of adapted and flexible indicators and an Excel based Benchmarking Tool.

Data in the BT can be entered for a single year or for multiple years, enabling users to monitor trends and changes for each indicator and dimension. This facilitates the identification of progress or decline in specific AKIS components. The BT also functions as a long-term data repository, preserving institutional memory and supporting continuous AKIS diagnostic and awareness.

Importantly, the BT does not produce rankings or definitive performance scores. Instead, it offers a structured framework for evidence-based reflection and dialogue, encouraging users to interpret results according to priorities and needs. The BT's flexibility and modularity make it suitable for different levels of application, from comprehensive AKIS benchmarking to focused assessments of specific subsystems. The BT can strengthen governance, inform targeted interventions, and contribute to the continuous improvement of AKIS performance.

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2. Introduction

The European Commission is taking steps to enhance the Agricultural Knowledge and Innovation Systems (AKIS) as a key lever to support the green and digital transitions in agriculture. This initiative, based on Article 114 (modernization) and Article 15 (advisory services) of Regulation (EU) No. 2021/2115 (CAP-SP Regulation), aims to facilitate the spread and implementation of new agricultural knowledge and processes of co-creation. Consequently, all Member States (MS) are committed to implementing AKIS related interventions. The focus is on improving knowledge flow organization and fostering collaboration among research, extension services, and practical agricultural activities. The goal is to accelerate the adoption of new knowledge in agricultural practices.

To this end, the EU has called for a project in the frame of the Horizon Europe (HE) program to support the capacity development of the governing bodies of the AKIS strategies that are funded by the CAP Strategic Plans 2023-2027 and of the key actors of change of agricultural systems. The aim is to strengthen the AKISs functioning on the ground across EU and make them better functioning to contribute to achieve a more modernized, resilient, sustainable and competitive agriculture in Europe. The successful proposal for this call was the HE project 'modernAKIS' (www.modernakis.eu). One of objectives of modernAKIS, is the development of an AKIS benchmarking tool (BT) that can be used by AKIS Coordination Bodies and other actors as a tool for promoting continuous improvement in AKIS performance across the member states.

Against this background, Task 1.3 in WP1 aims to develop a BT that assesses the performance of AKIS components, provides a framework for identifying areas of improvement, supports continuous learning, and enables comparative analyses of selected AKIS features across MS. The tool gives specific attention to elements that can be considered as good strategies, practices, and instruments for achieving a well-functioning AKIS, taking into account institutional, economical and socio-cultural contexts.

The BT provides a structured set of indicators that allow users to assess, reflect upon, and compare key dimensions of their AKIS. These indicators were developed and refined through a participatory process involving experts and representatives within the modernAKIS consortium, ensuring they reflect practical relevance, feasibility, and a shared understanding of AKIS functioning. The final output is a tool that combines quantitative data and qualitative assessment, and is suitable for both national and regional application. In particular, the benchmarking tool consists of framework for AKIS Benchmarking, a set of indicators adapted for this purpose and accompanying guidelines. An Excel-based template serves as a practical and user-friendly format for the Benchmarking Tool. It provides a structured process for entering relevant indicator data, thereby enabling users to conduct a benchmarking analysis of the AKIS.

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This deliverable outlines the rationale, development process, structure, and intended use of the Benchmarking Tool. Chapter 3 provides a conceptual background of benchmarking, the differences with evaluation and its application in the context of AKIS. Chapter 4 describes the methodology and co-creation process used for the development of the Benchmarking Tool and its indicators. Chapter 5 delves deeper in the description of the five dimensions participating in the well function of an AKIS, which form the framework and conceptual foundation of the BT. In Chapter 5, the list of indicators for AKIS benchmarking will be presented and described in details. Chapter 6 contains a set of guidelines, a step-by step approach for AKIS benchmarking and how to use the indicators. As such, this Deliverable serves not only as a technical description of the tool, but also as a guide for its meaningful application within Member States.

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3. Background

3.1. Benchmarking – what is it?

Benchmarking is an ongoing, methodical process of comparing an organization's performance with that of its peers or industry leaders renowned for their excellence. It involves not only the collection and comparison of performance data, but also the identification of gaps between current performance and desired levels or "benchmarks" established by the best performers (Price, 2005). This continuous process requires benchmarks to constantly change and become more specific rather than being thought of as fixed targets.

While benchmarking is popularly associated with the mere data collection and copying of best practices, it is necessary to distinguish it from the comparison of just data. Effective benchmarking goes a step further to systematically establish the strengths and weaknesses that an organization possesses and then uses this knowledge to forge innovation and continuous improvement (Alosani, 2016). This process emphasizes how significant it is not just to replicate other people's activities but also to look into the processes behind the highest performance.

Box 1: Short history of Benchmarking

Benchmarking began as a private sector practice, first taking hold in manufacturing and later spreading to management and marketing, and has since been used throughout a wide range of disciplines, from engineering and community services to higher education and public utilities (Alstete, 2008). This approach expands traditional competitive analysis not only by comparing performance measurements but also by closely examining the processes that achieve better results (Kovacic, 2007). Benchmarking at its essence is a continuous improvement process with a goal to identify, implement, and ultimately surpass the practices of those who are the best in field. As firms seek to enhance both their operational and strategic practices, benchmarking has become one of the most effective tools available for driving continuous quality improvement (Jain et al., 2008).

The evolution of benchmarking was particularly intense during the period from the mid-1980s to the mid-1990s—a period during which its popularity was evidenced in a proliferation of related academic and professional writings. Its visibility has diminished somewhat since that time, with most organizations either replacing it or integrating its most important ideas into more expansive quality systems (Cole, 2009). Despite these shifts, benchmarking remains a critical process; it begins with performance measurement—a fundamental early step that includes the definition, selection, and utilization of performance indicators or "benchmarks"—and extends through to a broader cycle of reform implementation, outcome evaluation, and the continual review and redefinition of benchmarks (Cole, 2009).

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Apart from its broader applications in business and industry, benchmarking has also been established in the strategic management field as a process for enhancing organizational competitiveness and performance. In this context, benchmarking has been conceptualized as the deliberate identification and adoption of best practices specific to an organization, thereby facilitating gains in efficiency, performance, and overall competitiveness (Burt & Styles, 2004; Ongosi et al., 2020; Çakmak et al., 2004). In this strategic model, the systematic comparison of an organization's processes, products, or services with those of the best performers within the same industry or with competitors generates actionable insights that drive continuous improvement and build a culture of learning and innovation.

By ongoing evaluation and application of best practices, organizations are not just in a position to enhance operational efficiency and reduce expenses, but also enhance the quality of products (Ettorchi-Tardy et al., 2012). In this way, benchmarking is both a utilitarian management instrument and a strategic method of developing a learning organization that is better able to scan, reflect on, and adapt to its environment.

3.2. Differences between benchmarking and evaluation

Evaluation and Benchmarking are complementary processes that examine past events, assess current activities, and explore future possibilities. Evaluation involves analysing both past and present data to gain a comprehensive understanding of performance and effectiveness. It includes looking back at historical data to understand what has happened, identifying trends, and learning from previous successes and failures. At the same time, it can assess current activities in real-time to determine how well an organization or system is performing, enabling informed decision-making for ongoing improvement. Systematic methods are employed to support informed judgments about processes, practices, and programs that produce outputs and outcomes (Hogan, 2007, Wollman 2017).

Benchmarking refers to a “systematic process for securing continual improvement through comparison with relevant and achievable internal or external norms and standards” (Malano & Burton, 2001: p1). It is about sharing and learning. It is also grounded in an awareness of what has been accomplished, what worked, and what to possibly avoid. The process implies comparison – either internally with previous performance and desired future targets, or externally against similar organisations, or organisations performing similar functions. Depending on its focus, benchmarking can inspire new ideas, broaden the possibilities of what can be achieved, speed up project timelines, and establish methods for measuring progress and success (Flesher & Bragg, 2013).

While both are aiming to the overall goal of performance improvement, they have distinct roles. Benchmarking is primarily a proactive tool, with the objective to search for and bring in best practices to initiate a continuous improvement. One main distinction between

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benchmarking and evaluation lies in their underlying purpose or intent. Evaluation is primarily oriented towards accountability and carries an inherently judgmental character, assessing performance against predefined criteria. Benchmarking, by contrast, is centered on learning, focusing on the identification of strengths, weaknesses, and opportunities for improvement through comparison and reflection. Where evaluation answers to questions such as "what has happened?" or "what is happening?", benchmarking addresses the question "what can be improved?".

3.3. Benchmarking approaches and steps

Auluck (2002) outlines there are three main benchmarking approaches in practice:

I. Comparing outputs, or measures, from different organizations or systems. These can be quantitative, e.g., cost, price, response time or error rates. They can also be qualitative, e.g., customer satisfaction levels, employee satisfaction levels.

II. Assessing against a level of performance or standard which defines 'best practice' or a range of working practices and policies. It might be a published standard or a known standard, such as a quality organization.

III. Undertaking a detailed examination of the processes which produce a particular output, through internal and comparative analysis, with a view to understanding the reasons for difference in performance levels, and drawing out best practice.

Regardless of the approach chosen, Longbottom (2000), emphasizes that every benchmarking activity encompasses four distinct steps, each essential for ensuring a thorough and effective assessment. These steps are: Planning, Analysis, Integration, and Action, similarly to the Plan–Do–Check–Act (PDCA) cycle described by Sarkis, 2001:

I. Planning step: as a foundation for the benchmarking process, it involves several activities, including:

   a. a thorough examination of the current processes and performance levels of own organization/system.

   b. evaluating strength and weakness to prioritize areas for benchmarking

   c. setting clear objectives, defining the scope of the benchmarking study, and assembling a team responsible for carrying out the benchmarking activities.

II. Analysis step: involves gathering and interpreting benchmarking data. The activities in this step may include:

   a. identifying potential partners/organizations or system that can serve as benchmarks.

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b. gathering information about the partner/organization or system

c. site visits and observations of process to attain valuable insights about how the others are performing

III. Implementation step: translates insights into practical improvements. This step involves two main activities:

a. adaptation of processes which involves tailoring the lessons and best practices identified during the analysis step to fit the specific context. It may involve modifying processes, workflows, or organizational structures; and

b. implementation, which involves putting the adapted processes into practice. This step requires careful planning, resource allocation, and effective change management to ensure successful adoption.

IV. Review step: ensures that the benchmarking process stays dynamic and continuous. It involves two main activities:

i. (i) regularly assessing the implemented changes to evaluate their impact on performance. This includes comparing post-implementation performance metrics with baseline data to measure improvement; and

ii. (ii) repeating benchmarking by continuously seeking new benchmarks and striving for further improvements for maintaining competitive advantage and fostering a culture of continuous improvement.

3.4. Benchmarking for AKIS

The notion of Agricultural Knowledge and Innovation Systems (AKIS) has gradually developed over the years, shaped by successive paradigms of agricultural development According to the EU Regulation for the CAP 2023–2027, AKIS is defined as “the combined organization and knowledge flows between persons, organizations and institutions who use and produce knowledge for agriculture and interrelated fields.”

The use of benchmarking concepts to Agricultural Knowledge and Innovation Systems (AKIS) is a non-traditional evolution of its application. Benchmarking within the AKIS can be employed as a method for measuring and enhancing particular activities, combined and aggregated measures, programs etc., which relate to e.g., knowledge flows, innovation capacity, and advisory capacity, to name a few.

Within the AKIS frame, benchmarking is specifically challenging as it does not refer to one organization only, but usually to a group of entities, to a network or to a subsystem therein. Benchmarking in this context needs to be tailored to the needs and interests at hand. It can be used in the comparison of various aspects such as actor networks, knowledge

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dissemination effectiveness, and the overall impact of advisory services on agricultural practice. By comparing performance systematically across regions, institutions, or other units, actors can derive sound, quantitative indicators that inform strategic planning, priority setting, policies formulation and operational change. These indicators can support to track progress and position public institutions, decision makers, and individual institutions within the broader context of agricultural innovation.

Benchmarking AKIS involves operationalizing these conceptual considerations into methodologies. A key challenge to benchmarking AKIS is the heterogeneity of agricultural data and contexts. Moreover, AKIS is an open system, not defined by boundaries or limits as a traditional enterprise or organization can be. Variability in socio-economic and institutional contexts tends to render simple comparisons between regions or institutions problematic. In addressing these issues, mixed-methods approaches can be employed that combine quantitative measures with qualitative observations. This kind of hybrid approach can overcome the limitations of working with numerical data alone. Moreover, frameworks such as those derived from the CAP monitoring and evaluation guidelines are often used to create a common ground for evaluation, thereby enhancing the comparability and relevance of the benchmarking results.

The AKIS benchmarking tool aims at comparing AKIS related activities and operations within AKISs, their subsystems or branches in single or several EU MS and regions and assess management practices. By providing a structured framework for comparison and analysis, the tool provides insights for improving the AKIS functioning through targeted interventions. Targeted audience for the benchmarking tool is the AKIS coordination bodies/key actors of change and other interested AKIS stakeholders.

In the context of the AKIS, unlike formal evaluation processes, which must be carried out by independent evaluators and follow a predefined methodological approach over a specific timeframe (European Evaluation Helpdesk 2025), the Benchmarking Tool (BT) is designed as a practical reference tool to be directly used by AKIS Coordination Bodies (AKIS CBs) and other AKIS actors. Evaluation typically involves a structured process with defined objectives, defined indicators, and data collection protocols aimed at assessing the effectiveness of interventions, programs or policies. The BT does not constitute a full evaluation process but rather offers a flexible set of indicators that can be used at any point to assess or reflect on the performance of an AKIS or one of its components. It is a tool for internal use and self-reflection, enabling users to generate insights without requiring external evaluation mechanisms or formal procedures.

With this deliverable, we present a managerial tool for AKIS CBs to systematically identify, assess and learn about key areas/dimensions of their AKIS and those of other MS AKIS in order to learn, improve and understand the reason for the difference in the level of AKIS

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functioning. In other words, the benchmarking tool will "help Member States to benchmark among them in order to choose the most effective AKIS interventions adapted to their local/regional/national situations. It should improve learning on how to organise their AKIS to improve its functioning" (Outcome 2 on Grant Agreement).

It is important to note that, at this stage, the benchmarking operations remain within the respective countries: there is no central database to access or share the exact analyses carried out by each MS. As the tool is developed in Excel, each Member State uses it independently. If one MS wishes to compare itself to another, this has to be initiated and organized bilaterally, as the results are not downloadable or stored centrally.

3.5. Specific objectives and purposes of AKIS Benchmarking

- **Specific Objectives**

The three primary objectives of AKIS Benchmarking represent its core application layers:

1. **Self-diagnosis and system awareness**

Benchmarking operations support the CBs in gaining a comprehensive picture of their own AKIS. This includes dimensions and aspects that often go unmeasured, unreported, or disconnected. By organizing this information into a coherent structure, the tool allows users to identify strengths, gaps, and patterns in their knowledge systems.

2. **Internal benchmarking over time**

Users can apply benchmarking to compare their own performance over time (e.g., yearly), creating an internal monitoring function. This time-series component is critical to track system changes, policy effects, and evolving challenges or opportunities.

3. **Cross-country comparison and learning**

Benchmarking operations also facilitate cross-country or regional comparisons, enabling peer learning and knowledge exchange. Due to the diversity of AKIS contexts across the EU, such comparisons must be approached with caution and used to extract strategic insights, not rankings.

- **Operational purposes**

In addition to these functional layers, AKIS Benchmarking also serves several operational purposes that define its broader usefulness and expected outcomes:

1) The tool will enhance the ability to systematically and straightforwardly access relevant information enabling AKIS CBs to answer questions such as:

- How is the AKIS in consideration positioned in the EU context?

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- Where should efforts be focused?
- What strategies do others use to advance their AKIS?

The benchmarking operations allow AKIS CBs to gain insight about their own AKIS in a succinct manner by highlighting strengths, weaknesses, best practices and areas of improvement in certain topics or dimensions. The tool provides a set of dimensions and performance indicators for a well-functioning AKIS to improve performance. For example, at one point of time actor diversity could be a topic for comparison for AKIS CB "X", whereas knowledge infrastructures are relevant for comparison for AKIS CB "Y". At another point of time benchmarking the advisory sub–system alone could be relevant for AKIS CB "X". In other words, AKIS CBs are not required to conduct AKIS benchmarking as a whole but rather pick parts and pieces that are deemed crucial or inadequate in their case in the certain point of time.

2) Capitalize on already available information to assess AKIS functioning (e.g., AKIS diagnostic studies, CAP strategic plans, evaluation results, etc), by using standardized metrics that would allow to measure quality of inputs, processes and outputs in AKIS.

The benchmarking tool functions as a guide for AKIS CBs on what needs to be assessed and understood for a well-functioning AKIS. Categories worthy of assessing and understanding are consolidated based on existing information sources and on the needs of the AKIS-CBs. A set of indicators (qualitative and quantitative), proxy indicators has been identified from already existing sources. Here, users are not expected to gather new empirical data. Information sources for benchmarking can include, for example, AKIS diagnostic reports, CAP strategic plans, other policy documents from the Managing Authorities.

3) Improve the capacity to learn from other AKIS in order to optimize own internal processes. The lessons and reflections may result in AKIS CBs' designing new interventions, programs and working modalities.

The focus here is on the recognition of the necessary knowledge to understand and analyse AKIS' situations by giving practical examples. The assumption is that through the benchmarking process AKIS CBs will be well informed to change and improve their AKIS, if other institutional and contextual factors allow them as well.

4) Support the continuous development of skills and competencies to diagnose and analyse AKIS and to plan future interventions.

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4. Methodology

4.1. Desk study

The AKIS Benchmarking Tool has been created following a step-wise approach.

The framework developed within the BT consists of the five dimensions of a well-functioning AKIS. These were identified in deliverable D1.10 of modernAKIS and later co-adjusted and validated with project partners and representative of the Coordination Bodies during the modernAKIS General Assembly in April 2024, in Madrid. A detailed description of the five dimensions can be found in Chapter 5 of this deliverable.

A literature review was conducted on the concept and steps of benchmarking, as well as on the main differences between benchmarking and evaluation, as described in Chapter 3. In parallel, a desk study was carried out to identify an initial list of indicators relevant for AKIS benchmarking. These indicators were drawn from established frameworks and tools, as well as scientific sources, including modernAKIS D1.1, FAO, the CAP evaluation guidelines, SCAR AKIS reports, and the World Bank. The resulting list consisted of 208 indicators, which were grouped under the five dimensions (1. Actor diversity and constellations of knowledge infrastructures; 2. The strength of advisory services; 3. The presence and the types of coordination mechanisms that facilitate collaboration, decision-making, and resource allocation; 4. The configuration of AKIS supporting policies, regulations and funds allocated to AKIS intervention; and 5. The degree of interactions among the diverse actors to facilitate knowledge sharing, innovation, and partnership.).

From this list, an initial selection was conducted internally by the University of Hohenheim team, alongside adjustments needed to ensure the indicators could be applied in the context of benchmarking at both regional and national levels.

4.2. Co-creation process

Starting from March 2025, the AKIS Benchmarking Tool Working Group (BT WG) was formed within the modernAKIS project consortium. The group consisted of project partners and representative of the CBs, engaging in a co-creation process to select and adjust indicators for benchmarking. The participants are listed as contributors to this deliverable. The BT WG met in a series of six online sessions between March and April 2025 during which each indicator of the five dimension was assessed and discussed from participants coming from different Member States and different expertise, ensuring multiple perspectives were considered. Each session followed a flexible structure which included a short initial presentation of the dimension and indicators to be assessed, 20 minutes of breakout group discussion followed by a more extended plenary discussion. Additionally, two polls using Mentimeter were conducted at the beginning and at the end of the session respectively.

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These sessions served several purposes: screening, shortening and validating the initial indicator list; discussing and refining definitions, especially for concepts that differ across national contexts; identifying data availability issues and potential proxies or qualitative alternatives.

Following the initial longlist, indicators were screened and categorized according to three main criteria, co-defined with the BT WG:

- Relevance to the dimension and AKIS improvement goals
- Feasibility of data collection in a diverse EU context
- Practical use for CBs and other users

Each indicator was then discussed during the working group sessions and annotated with feedback from the Miro boards used during the online sessions and meeting minutes. This feedback was analysed internally by the UHOH team and coded to rank each indicator as high, medium, or low priority. In some cases, indicators with low or mixed rankings were still retained, if they served a key diagnostic function or addressed a blind spot in AKIS analysis. In many cases, opinions on specific indicators differed sharply among WG members, reflecting the diversity of priorities and perspectives across Member States. This diversity posed challenges in accommodating all views uniformly but also enriched the process. As a result, the final Benchmarking Tool reflects this variety by remaining flexible and adaptable to users' needs and preferences.

In parallel with indicator finalization, a set of guidelines was written. These explain how to use the indicators, including examples, standard definitions, and suggestions for data sourcing and interpretation. The guidelines emphasize the flexibility of the tool and the importance of user judgement, particularly when it comes to defining the boundaries of key terms (e.g., whether "agriculture" includes forestry and fisheries in a given country).

A dedicated final workshop was held in June 2025 with registered participants from the modernAKIS consortium, Coordination Bodies and members of the BT WG. The objective was to test the nearly finalized indicator list and gather structured feedback. The workshop combined plenary presentations with group discussions around selected indicators, focusing on two core questions: "*Where can I get the data for this indicator in my country or region?*" and "*What does this indicator tell me about my AKIS, and what are its implications?*". The insights from this session were used to further refine indicator definitions, strengthen the guidelines, and prepare the final version of the Benchmarking Tool for delivery.

4.3. Excel based Benchmarking Tool

An Excel based Benchmarking tool has been developed to support users in carrying out AKIS benchmarking. The tool consists of a stand-alone template with one input sheet, one

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for each of the five dimensions of a well-functioning AKIS. In the input sheets, the list of indicators for that specific dimension is listed for multiple years, allowing users to enter data for year of choice. Each indicator consists of multiple data fields, two most of the time, which are described in a dedicated column (i.e., the total number of xyz and GDP). Users are then required to enter the requested data in the dedicated input cell. Each indicator always comes with a text field, which allows users to annotate, comment, describe and document further the figures and data fed into the BT.

Once the data is entered for specific indicators and/or dimensions, they are collected and processed in a hidden sheet, where calculations and data normalizations are done. To make it easier for users of the tool, said sheets will be locked and hidden in order to prevent accidental modifications, ensure the integrity of calculations, and maintain a clean and user-friendly interface.

Each dimension also has an individual data visualization sheet, where users can see tables and plots resulting of the data they input. Users can interact with these "dashboards", choosing the indicator(s) or the year (or years series) they want to visualize.

A fully detailed "Info" sheet is included in the Excel based tool with instructions on how to use it.

It's needed to mention that this version of the BT allows mainly for offline diagnostic and internal benchmarking. More elaborated functions for data comparison between different MS, that would allow for cross-country comparison, could be elaborated in the future, building on the framework and indicators presented in this deliverable.

4.4. Rolling out the Benchmarking Tool

As the BT has been mainly developed internally in the modernAKIS project consortium, it is important to mention that only a few representatives of the intended users, AKIS CBs, were involved in its development. The operation of benchmarking and the use of the indicators will need further explanations and interactions with end users. For this reason, it is intended to expand the dialogue and roll-out of the BT to the CBs through a series of workshops and tutorials to be realised within the frame of modernAKIS, namely in WP3 and WP4.

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5. Five dimensions of a well-functioning AKIS and related indicators

As described in the introduction and methodology chapters of this deliverable, the AKIS Benchmarking Tool has been developed based on five dimensions that contribute to the well-functioning of an AKIS. These have been identified from existing sources, namely D1.10 of modernAKIS, and form the framework and conceptual basis upon which the BT and its indicators can be used. In the following sub-chapters, the five dimensions will be described and five lists of indicators useful to benchmark each dimension will be presented.

5.1. What is a well-functioning AKIS?

There are five major dimensions that lead to a well-function AKIS: 1. Actor diversity and constellations of knowledge infrastructures; 2. The strength of advisory services; 3. The presence and the types of coordination mechanisms that facilitate collaboration, decision-making, and resource allocation; 4. The configuration of AKIS supporting policies, regulations and funds allocated to AKIS intervention; and 5. The degree of interactions among the diverse actors to facilitate knowledge sharing, innovation, and partnership.

The aim of Task 1.3 was to identify relevant indicators for these dimensions that can be used as benchmarks to assess the performance of AKIS or specific components of AKIS and to identify areas of improvement.

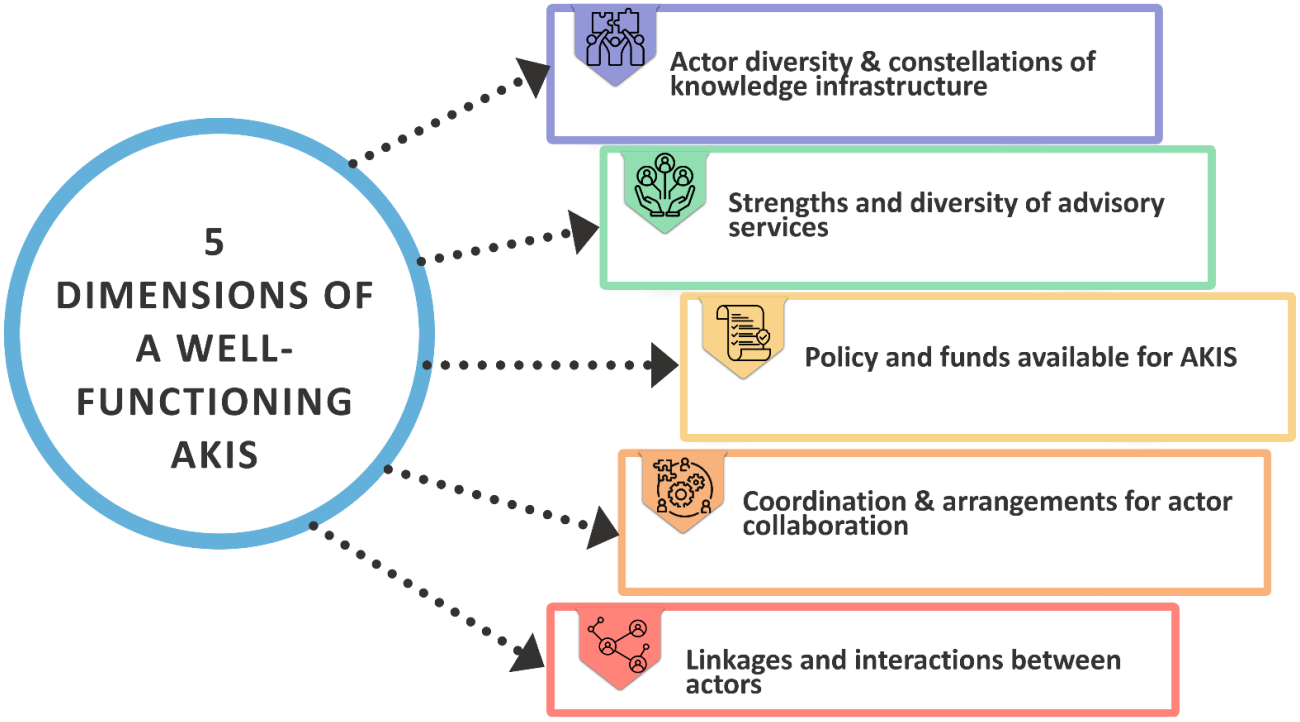

Figure 1: five dimensions of a well-functioning AKIS, authors elaboration.

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1. *Actor diversity and constellations of knowledge infrastructures*: This dimension assesses the presence of a variety of actors and their human resources such as research centres, education institutions, advisory service providers, farmers and industry as well as infrastructures available to facilitate the generation, exchange, and use of knowledge.
2. *Strength and diversity of advisory services*: Advisory service providers play a crucial role in integrating actors in the AKIS. The strength of human resource, back-office and front office are crucial in facilitating knowledge exchange and innovation.
3. *Coordination arrangements for actor collaboration*: By fostering cooperation, these mechanisms enable knowledge exchange between actors and encourage actors to perceive themselves as being part of a larger system, thereby aligning diverse perspectives, experiences and knowledge (Klerkx et al., 2012). AKIS requires effective coordination mechanisms to facilitate collaboration, decision-making, and resource allocation. The presence of coordination mechanisms such as platforms, working groups, networks or forums that bring together different actors strengthens knowledge flow and exchange.
4. *Policies and funds available for supporting AKIS*: The policy environment and regulatory framework play a pivotal role in shaping the structure and operation of AKIS. Supportive policies, regulations, and incentives foster collaboration, innovation, and knowledge transfer within AKIS. Furthermore, adequate funding and financial resources are essential for AKIS to function effectively. The availability and allocation of funds for research, innovation projects, extension services, and capacity building can influence the activities and outcomes of AKIS. In general, polices that support AKIS incentivise agricultural knowledge and innovation processes, thereby stimulating agricultural productivity growth and sustainable resource use. Focus is given to policies and funds at EU level, as well as on EU co-funded measures and policies at National and/or regional level.
5. *Linkages and interactions between actors*: AKIS actors are interconnected to each other by specific forms of interaction. The presence of cooperation and partnerships among AKIS actors facilitates knowledge sharing, and interactive innovation. The types and degree of interactions influence the flow of information, expertise, and resources within AKIS.

5.2. Indicators relevant for AKIS analysis

In agriculture, there are many indicators to measure various aspects such as farm performance, agricultural innovation, and research outcomes. However, there is a significant

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gap in metrics to assess performances related to AKIS. modernAKIS aims to fill this gap by developing indicators that can be used to assess the performance.

The following sections elaborate the indicators that have been selected as relevant to benchmark an AKIS or component(s) of an AKIS using the five dimensions.

The proposed indicators take into account the ones proposed by the CBs as well as indicators drawn from literature including: D1.1 of modernAKIS, CAP guideline for evaluating AKIS strategies, SCAR AKIS documents, World Bank and FAO sources. The UHOH team and the Benchmarking Tool Working Group systematically assessed, adjusted and categorized the list of indicators into the five dimensions, as described in Chapter 4 of this Deliverable.

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5.3. Dimension 1: Actor diversity and constellation of knowledge infrastructure

The dimension 'Actor diversity and constellation of knowledge infrastructures' is fit to support the creation of an overview or a reference frame for further particular analyses.

AKIS corporate actors, their human resources, and infrastructures comprise all organizations and social entities involved in the generation, sharing, use and assessment of knowledge and innovation in the agricultural sector respectively in the agri-food-systems. Their mere existence is not the focus of the benchmarking; rather, it is their characteristics, considering both qualitative and quantitative aspects related to actors and infrastructures that offer meaningful insights into the state of an AKIS or its components.

Table 1: List of indicators for Dimension 1, including indicator number, indicator name, rational and description and examples.

No.	Indicator	Rationale	Explanation and examples
1.1	Number of agricultural research stations, in relation to agricultural GDP.	Reflects research infrastructure.	Measures the number of operational agricultural research stations per unit of agricultural GDP, to reflect research infrastructure relative to sector size. To be used at both national or regional levels. A research station is considered any facility dedicated to conducting scientific studies and experiments in agriculture. It includes laboratories, experimental fields, and technical staff, and focuses on developing and testing innovations. It is up to the users to define boundaries corresponding to their national priorities.
1.2	Number of staff in public agricultural authorities, in relation to total number of farmers.	Reflects access options to public services, providing assessment of the back-office situation	Number of people (in FTE - Full Time Equivalent) working in national or regional public authorities dealing with agriculture (e.g., ministries, agencies, CAP administration).
1.3	Number of staff in public agricultural research stations, in relation to agricultural GDP.	Reflects strength of applied research in the AKIS	Number of people (FTE) working in national or regional public and/or private agricultural research station. A research station is considered any facility dedicated to conducting scientific studies and experiments in agriculture. It includes laboratories, experimental fields, and technical staff, and focuses on developing and testing innovations. It

			is up to the users to define boundaries corresponding to their national priorities.
1.4	Number of staff in public agricultural research organizations, in relation to the agricultural GDP.	Reflects importance and strength of the subsystems	Total number of employees (FTE) working in public institutions focused on agricultural research, including researchers, technical staff, and administrative personnel. Examples include national agricultural research institutes, public universities with agricultural departments, and government-funded research agencies.
1.5	Number of staff in public agricultural advisory organizations, in relation to total number of farms.	Reflects importance and strength of the subsystems	Total number of employees working in publicly funded institutions providing agricultural advisory services. This includes field advisors, technical experts, administrative personnel, and support staff. Examples are regional extension services, government advisory agencies, and public chambers of agriculture.
1.6	Number of staff in agricultural education organizations in relation to number of farmers.	Reflects importance and strength of the subsystems	Includes teaching and training staff (FTE) in public institutions focused on agricultural education (e.g., universities, technical schools, vocational training centres).
1.7	Number of publicly funded digital platforms effectively supporting practice-oriented exchange in the AG sector	Assess the availability and effectiveness of digital spaces where actors can access and share practical knowledge.	A digital platform effectively supporting practice-oriented exchange should go beyond being a static website. It must be regularly updated (at least monthly), include a search function, allow interaction (e.g., inquiries, comments, contributions), and show signs of active use (e.g., over 1,000 monthly visits or visible user engagement). Passive or outdated sites should not be counted.
1.8	Number of publicly funded digital tools supporting advisory work.	Degree of digitalization of AKIS activities	Digital Advisory Tools and Services (DATS) are technologies which include computer and mobile phone applications and services. They may stand alone, on individual devices, or be connected via the web. Their primary function is to assist advisors to deliver a farmer-focused, decision support service or to assist in administrative or communication tasks.

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1.9	Share of AKIS actors supported by the AKIS interventions by types (e.g., advisors, researchers, farmers/foresters, NGOs, SMEs) - share of the type of actor over total	Assess the inclusiveness and balance of AKIS interventions	Examples: participation in CAP Strategic Plan measures, national programs funding innovation hubs, advisory networks, or training schemes. Up to the CBs to tailor to their specific context.

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5.4. Dimension 2: Strength and diversity of advisory services

Well-established structures mandated to respond to farmers' knowledge needs are crucial for a well-functioning AKIS. In this regard, actors such as public advisory organizations, private advisory organizations, farmer-based organizations (e.g., cooperatives, unions, associations and chambers of agriculture) and NGOs have demonstrated their indispensable role in the AKIS. The capacity and integration in the AKIS of service providers directly interacting with farmers varies across contexts. Benchmarking these aspects provides valuable insights and actionable information that would contribute to a well-functioning AKIS

Table 2: List of indicators for Dimension 2, including indicator number, indicator name, rational and description and examples.

No.	Indicator	Rationale	Explanation and examples
2.1	Total number of advisors, in relation to the total number of farmers.	Appraisal of the strength of the advisory services.	It is at user discretion to include public and/or private advisors, depending on the specific national or regional context and on the data availability.
2.2	Share of advisors participating in OGs, in relation to the total participants.	Reflects inclusion of advisory services in innovation platforms.	Proportion of advisors (public and/or private) who are actively involved in Operational Groups (OGs) under the European Innovation Partnership.
2.3	Number of trained advisors per year, in relation to the total number of farmers	Reflects trends in capacity development	The indicator refers to the number of agricultural advisors who have completed a formal training or upskilling activity (e.g., vocational training, peer learning, workshops) over a one-year period. It includes participation in government or EU-funded training programs, certification renewals, or thematic upskilling initiatives (e.g., digital tools, sustainability practices). The training should be certified and/or done on a regular basis.

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2.4	Hours of innovation support related trainings for advisors	Reflects trends in capacity development	This refers to the average total number of hours that agricultural advisors spend attending training specifically focused on innovation support, including facilitation, multi-actor collaboration, or helping farmers adopt new practices or technologies. Examples: includes workshops on innovation brokering, courses on participatory methods, or sessions on EIP Operational Group facilitation. Consider only certified or required/mandatory hours of training in the past one-year period.
2.5	Hours of trainings on the use of digital tools for advisors	Reflects trends in capacity development	Refers to the average total number of hours over a one-year period that agricultural advisors spend in training sessions specifically focused on learning how to use digital tools that support advisory services, knowledge exchange, or farm decision-making. Examples: includes trainings on farm management software, remote sensing apps, or digital platforms for advisory delivery.
2.6	Number of cross-border visits, in relation to total number of advisors.	Reflects the exposure of advisors to international practices and peer learning, which strengthens cross-border knowledge flows.	Refers to the number of professional visits, exchanges, or study trips conducted by advisors to other countries or regions, relative to the total number of advisors (per 1000), over a one-year period. Examples: includes participation in EU-funded exchange programs, bilateral visits between advisory services, or learning missions within international networks like EUFRAS or IALB. Refer to figures from EIP and projects.
2.7	Qualitative assessment of training received by advisors	Reflects trends in capacity development	This indicator captures advisors' overall satisfaction and perceived usefulness of trainings received under EU co-funded measures, based on standard post-training evaluation forms (e.g., Likert scale assessments). Data should be accessible via national CAP monitoring systems and is limited to trainings funded under EU measures.
2.8	Share of farmers using support for advice, training,	Reflects efficiency and reach of advisory services.	For cross-country benchmarking, use the CAP-reported figures; for internal analysis you may include similar national-funded activities when available.

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	and knowledge exchange		
2.9	Total public expenditure on agricultural advisory services, in relation to the total number of farmers.	Reflects political importance of the advisory sub-system.	Use figures from EU co-funded measures specifically targeting advisory services. In cross-country comparisons, note that national totals may vary widely.
2.10	Number of CAP Network actions that include advisors, in relation to the total number of actions	Reflects importance of the sub-systems at CAP level	Use absolute numbers. Two data fields are present in the Tool for input of total actions and actions targeting advisors.

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5.5. Dimension 3: Coordination arrangements for actor collaboration

Effective coordination is crucial in a pluralistic AKIS due to the diverse and interconnected nature of actors involved in knowledge generation, exchange, and use. Coordination fosters collaboration, resource optimization, diverse knowledge sharing, and continuous improvement, all of which are critical for the system's success and sustainability.

Coordination mechanisms in AKIS are structures and processes designed to stimulate the exchange of information and the cooperation among autonomous and interdependent stakeholders towards a shared vision. These mechanisms can be formalized through written agreements, laws and regulations and may have fixed structures and agenda, closed participant list and predefined procedures. Alternatively, they can be loosely structured with open participation list, and dynamic agendas and processes such as networking events, conferences and workshops organized to bring stakeholder together. Coordination mechanisms can be supported by infrastructures such as online platforms or knowledge database, or by having a dedicated unit or department, e.g., AKIS coordination unit or working group

Benchmarks on coordination mechanisms in place and how they function, can provide better understanding of the extent to which access to knowledge and cooperation between various actors is supported at a country or region level.

Table 3: List of indicators for Dimension 3, including indicator number, indicator name, rational and description and examples.

No.	Indicator	Rationale	Explanation and examples
3.1	Number of mechanisms for coordination among advisory service providers	Reflects the diversity of strategies used to align knowledge exchange and collaboration between similar and diverse actors at various levels	Counts the structured forums, meetings, or bodies that facilitate cooperation and information exchange specifically among advisory service providers. Examples: regular advisory forums, national or regional advisory platforms, thematic working groups (e.g., digitalization, agroecology) coordination committees, formal networks with defined participants and agendas, formalized consortia or partnerships.

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3.2	Number of mechanisms for coordination of research and education actors	Reflects the diversity of strategies used to align knowledge exchange and collaboration between similar and diverse actors at various levels	Counts the formal or institutionalized structures that promote cooperation and information exchange among research and education actors. Examples: joint research platforms, education consortiums, coordination committees with set agendas.
3.3	Number of mechanisms for coordination among private and public sectors	Reflects the diversity of strategies used to align knowledge exchange and collaboration between similar and diverse actors at various levels	Counts the structured forums or bodies that facilitate collaboration and information exchange between private and public sector actors. Examples: public-private working groups, multi-stakeholder platforms, joint committees with formal procedures.
3.4	Number of stakeholders participating in AKIS coordination activities promoted by CBs.	Reflects scale of CB-led coordination.	Measures how many stakeholders take part in CB-led AKIS coordination activities over a one-year period. Examples: participants in multi-actor meetings, national AKIS platforms, coordination events.
3.5	Diversity of stakeholders participating in AKIS coordination activities promoted by CBs.	Reflects scale of CB-led coordination.	Counts the number of different stakeholder types (e.g., farmers, advisors, researchers, NGOs, education providers, public bodies) who took part in CB-led AKIS coordination activities over a one-year period. Data can be collected from participant lists or reports of events such as AKIS platforms, workshops, or coordination meetings.
3.6	No. of days or hours in training programs that cover multi-stakeholder innovation processes (facilitation,	Self-assessment on capacity building	Measures the total time CBs spent in training on facilitation, networking, co-creation, and other multi-actor innovation skills over a one-year period. Examples: workshops on interactive innovation, courses on facilitation techniques, training in stakeholder engagement.

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	networking, etc.) for the CBs		
3.7	Satisfaction with the training - self assessment of indicator 3.6	Self-assessment on capacity building	Self-assessed satisfaction of CBs who participated in training on facilitation, networking, and co-creation over a one-year period.
3.8	Share of different actors included in OGs by types (e.g., advisors, farmers, researchers, education actors).	Highlights the multi-actor nature of innovation within OGs.	Tracks the composition of OGs by actor type (e.g., advisors, farmers, researchers, education actors), expressed as a share of total OG participants. Actor-breakdown from OG membership lists, project reporting. Can be monitored over time to assess diversification.
3.9	Number of cross-border OGs and OGs incorporating cross-border expertise.	Reflects the level of international/cross-regional collaboration and knowledge exchange within EIP Operational Groups.	Counts the number of OGs established under the EIP-AGRI framework that either involve actors from more than one country (cross-border OGs) or actively integrate expertise from institutions or individuals based outside the host country. Data can be retrieved from CAP Network records, EIP-AGRI databases, or national CAP Strategic Plan monitoring reports.

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5.6. Dimension 4: Policies and funds available for supporting AKIS

AKIS-related policies and financial resources serve as formal acknowledgments of the importance of the AKIS at policy level. They also reflect political objectives, agendas, and the allocation of public funds dedicated to knowledge exchange and innovation. Furthermore, the policy environment and regulatory frameworks play a crucial role in determining the effectiveness of AKIS. Mainly because these frameworks are vital for promoting collaboration, fostering innovation, and facilitating knowledge transfer within AKIS.

Moreover, AKIS related policies facilitate allocation of sufficient funds and access to financial resources, ensuring that research and innovation activities are well-supported. The availability of funds drives the production and dissemination of new knowledge. Additionally, financial incentives motivate stakeholders to engage more actively in AKIS, promoting continuous improvement and adaptation to emerging challenges and opportunities.

Public expenditure on research and innovation in the agri-food sector is a key pillar in this regard. Similarly, public funds allocated to advisory and innovation services are essential. However, focusing solely on public expenditure has limitations, as contributions from the private sector and civil society also play significant roles in shaping and enhancing the AKIS design and operation.

Table 4: List of indicators for Dimension 4, including indicator number, indicator name, rational and description and examples.

No.	Indicator	Rationale	Explanation and examples
4.1	Share of the aggregated budged for the 4 types of AKIS interventions in the CAP SP	Reflects the share of AKIS related interventions in relation to other CAP interventions	This data can be found in each country's CAP Strategic Plan
4.2	Share of the budget for interventions in the CAP-SP relative to farm advice and farm advisors (Article 15)	Reflects the share of specific AKIS related interventions in relation to other CAP interventions	This data can be found in each country's CAP Strategic Plan

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4.3	Share of the budget for interventions in the CAP-SP relative to knowledge exchange, advice and information (Article 78)	Reflects the share of specific AKIS related interventions in relation to other CAP interventions	This data can be found in each country's CAP Strategic Plan
4.4	Share of the budget for interventions in the CAP-SP relative to innovation-related activities of CAP Networks (Article 126)	Reflects the share of specific AKIS related interventions in relation to other CAP interventions	This data can be found in each country's CAP Strategic Plan
4.5	Share of the budget for interventions in the CAP-SP relative to EIP-AGRI Operational Groups (Article 127)	Reflects the share of specific AKIS related interventions in relation to other CAP interventions	This data can be found in each country's CAP Strategic Plan
4.6	Share of agricultural research and education expenditures with MAA component, EU funding only	Reflects efforts to allocate sufficient fund to integrate diverse stakeholders to close the research practice gap	Only EU-funded research and education programs that explicitly adopt the MAA should be counted. For example, Horizon Europe projects requiring co-creation and stakeholder involvement are typically eligible.
4.7	Number of national/state/regional policies that explicitly target to AKIS	Reflects the focus AKIS topic receives at national level	Counts national or regional policies or strategies that explicitly aim to strengthen AKIS, excluding those funded through EU programs. Includes policies that reference AKIS as a framework or objective and outline concrete actions to improve coordination, knowledge flows, or innovation in the agricultural sector.
4.8	(a) Existence of priority setting, strategic planning, and reform exercises in agricultural research and (b) frequency.	Reflects the governance of AKIS	Includes formal exercises like research agendas, strategic plans, or policy reviews aimed at aligning agricultural research with sectoral needs. Should refer to documented processes carried out at least at the national or regional level.

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4.9	(a) Existence of priority setting, strategic planning, and reform exercises in agricultural Advisory sub-system and (b) frequency.	Reflects the governance of AKIS	Covers strategy revisions, reorganization of advisory structures, or reform initiatives at national or regional level carried out over a one-year period.
4.10	(a) Existence of priority setting, strategic planning, and reform exercises in agricultural education sub-system and (b) frequency.	Reflects the governance of AKIS	Covers curriculum updates, governance reforms, or institutional strategy changes in agricultural education at national or regional level over a one-year period.

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5.7. Dimension 5: Linkages and interactions between actors

Linkages and interactions are fundamental to understand how AKIS actors interact and collaborate to facilitate knowledge exchange and address challenges. Linkages represent the structural relations between AKIS actors. They give an idea or map of which AKIS actors are connected, highlighting potential collaborations. But they do not reveal the quality of the relation. We can classify linkages by direction and formality. Interactions on the other hand, involve dynamic engagement between actors, reflecting the quality and impact of the connections. They can be classified by intensity, frequency and functionality.

Understanding the nature and extent of linkages and interactions among AKIS actors is a complex task. The diverse and dynamic nature of these interactions, present significant analytical challenges. Nevertheless, "actor linkages and interactions" is a crucial dimension of the AKIS that must be assessed. To facilitate this assessment, we propose that AKIS CBs choose a few actors (e.g., 5), ideally from different sub-systems, which they closely work with and to assess their linkages from their perspective or to engage into discussion with those actors. In this case, the assessment result may not give a full picture of the linkages and interaction in the overall AKIS but provide a case specific picture. Alternatively, linkages and interactions can be assessed within EIP-OGs.

Table 5: List of indicators for Dimension 5, including indicator number, indicator name, rational and description/examples.

Indicator	Value	Definition	Explanation and examples
5.1 Directionality			
	Primarily uni-directional	Predominantly one-way flow of information or directives, often with limited feedback. Often top-down, following hierarchical structures (e.g., from a ministry to a subordinate research body)	Indicates a hierarchical structure with top-down communication. May suggest strong governance but also potential gaps.
	Bi-directional	Bi-directional: involving mutual exchange of information between two actors	Suggest mutual engagement and collaboration.

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	Multi-directional	Multi directional involving flow of information in various directions among all participants.	Reflects complex, interconnected network capable of handling diverse challenges and fostering innovation through multiple perspectives.
5.2 Formality			
	Formal	Formal- established through official channels or agreements, such as contracts, institutional partnerships	Indicates stable and reliable relationships, essential for long-term collaborations.
	Non-formal	Organized and intentional but flexible, such as workshops, trainings, fairs, conferences	Indicates organized yet flexible interactions that can respond to emerging needs.
	Informal	Naturally occurring connections based on personal relationships and networks, such as social gatherings, meet-ups, etc.	Reflects strong social capital and trust within the network, which can facilitate knowledge exchange and bottom-up innovation.
5.3 Intensity			
	Strong	Strength of engagement among AKIS actors.	Strong-intensity interactions are indicative of strong, committed collaborations that can drive innovation and effective knowledge exchange.
	Weak	More suitable to assess individual exchanges, can be measured in OGs	Conversely, weak-intensity interactions reveal weak engagement and potential areas for improvement, suggesting where additional support and initiatives might be needed to enhance collaboration and impact.

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5.4 Frequency			
	Regular	Reflects the regularity and consistency of engagements.	Regular interactions demonstrate sustained collaboration and ongoing trust-building, essential for continuous knowledge exchange and network stability.
	Intermittent	Reflects the regularity and consistency of engagements.	Intermittent interactions show moderate, periodic engagement that could benefit from more consistency.
	Irregular	Reflects the regularity and consistency of engagements.	Irregular interactions highlight gaps in communication, pointing to a need for more structured and frequent engagements to maintain strong connections.
5.5 Functionality			
	Collaborative	Highlights the purpose and effectiveness of interactions.	Highlights the purpose and effectiveness of interactions. Collaborative interactions show deep integration and shared objectives, crucial for problem-solving and achieving significant outcomes.
	Cooperative	Highlights the purpose and effectiveness of interactions.	Cooperative interactions indicate a good level of resource-sharing and mutual benefit, fostering synergy within the network.
	Competitive	Highlights the purpose and effectiveness of interactions.	Competitive interactions, while sometimes necessary, can signal areas of conflict and competition that may require alignment and coordination to ensure a cohesive and collaborative AKIS.

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6. Guidelines

6.1. How to use the AKIS Benchmarking tool and the indicators?

The AKIS Benchmarking Tool has been designed to be both structured and adaptable, providing a framework that can be applied across the diverse agricultural contexts of EU Member States. While it offers a coherent set of dimensions and indicators, it avoids imposing rigid rules, allowing users to adjust and interpret it in ways that reflect their own realities.

Member States vary widely in:

- Demographic and sectoral structures: e.g., farm sizes, number of farmers, agricultural land area
- Economic conditions: share of agriculture in GDP, level of private investment
- Institutional settings: centralized vs. decentralized governance, public vs. private service delivery
- Environmental and agro-ecological features

This diversity is why the BT is conceived as an adaptive and modular tool. It is equally suited for national-level benchmarking, regional-level assessments, or even sub-regional applications, depending on the needs of the user.

Indicators and Scope

The tool combines both quantitative and qualitative indicators.

- Quantitative indicators are normalized (e.g., per number of farmers or as a percentage of agricultural GDP) to make them comparable across contexts.
- Qualitative indicators capture contextual, institutional, or behavioral aspects that are essential for understanding AKIS performance.

Not all indicators can be applied uniformly across Member States. Data availability often depends on:

- Whether systems are centralized or decentralized.
- The role of private sector actors and informal networks.
- Existing statistical and policy-reporting mechanisms.

Users are encouraged to:

1. Select relevant indicators according to the scope of their benchmarking.
2. Adapt definitions of key terms (e.g., “advisory services”, “public authority”) to match their national or regional context and priorities.

3. Document decisions clearly, especially when excluding indicators or using proxies.

Context-Sensitivity and Definitions

Many AKIS concepts are context-dependent. For example, in some countries, forestry and fisheries are fully integrated into AKIS, while in others, they are separate; advisory services may be dominated by public actors in one Member State and by cooperatives or private providers in another. The BT treats these differences not as inconsistencies but as reflections of real-world complexity. Users are encouraged to define these terms in ways that best reflect their own reality and national or regional contexts.

Interpreting Results

The results generated by the BT should be understood as a structured reflection of the AKIS status, rather than as absolute measurements of performance. The BT is designed primarily for internal benchmarking and diagnostic purposes, enabling users to either assess a single year's diagnostic or to track developments across multiple years.

When used for a single year, the results provide a snapshot of the AKIS or of selected components, highlighting areas of strength, potential gaps, and aspects that may require further investigation or improvement.

When applied over multiple years, the BT allows the observation of trends through percentage change calculations for each indicator. An increase in a given indicator over time may suggest progress in that area, while a decrease could signal challenges, reduced capacity, or changes in contextual factors. These variations should be interpreted with caution: a positive change does not automatically imply effective policy or programs interventions; external factors such as economic trends, demographic shifts, or environmental events may influence results. A negative change does not necessarily indicate failure; it may reflect a strategic shift in priorities or methodological changes in data collection.

To support interpretation, the BT should be seen as both a measurement instrument and a long-term repository of AKIS-related information. By systematically recording indicator values, data sources, and contextual notes, the tool enables the accumulation of a historical database. This repository function is essential for tracking the evolution of the AKIS, ensuring that information is not lost over time, and providing a basis for more informed decision-making in the future.

Ultimately, the BT results should be read in relation to the specific objectives defined at the start of the benchmarking exercise, the selected indicators, and the broader institutional and socio-economic context. They should inform discussions among AKIS Coordination Bodies

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and other stakeholders, serving as an evidence base for reflection and strategic planning, rather than as a rigid performance scorecard.

6.2. Step-by-Step User Workflow for the AKIS Benchmarking Tool

The workflow below outlines the main stages for applying the AKIS Benchmarking Tool (BT) in a structured yet flexible manner. It is designed to accommodate the diversity of AKIS contexts across the EU while maintaining a consistent methodological approach. The proposed workflow is and adaptation of the methodological approach to benchmarking proposed by Longbottom (2000) and described in Chapter 3 of this Deliverable.

Step 1 – Defining Purpose and Scope

Prior to implementation, the user should determine:

- **Scope of analysis**:
  - One or more of the five AKIS dimensions
  - Specific sub-systems
  - Specific indicators
- **Geographical level**:
  - National
  - Regional

Step 2 – Selection and Adaptation of Indicators

The process involves:

1. Reviewing the full set of indicators across the five AKIS dimensions.
2. Selecting indicators relevant to the defined purpose and scope.
3. Adjusting definitions of key terms to reflect national or regional contexts.
4. Recording any exclusions.
5. Identifying proxy or qualitative alternatives where quantitative data is unavailable.

Step 3 – Data Collection

Data collection should prioritise existing sources such as AKIS diagnostic studies, CAP Strategic Plans, statistical databases, or institutional reports. For each indicator, the user should document:

- The data source
- The year(s) covered

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- Any assumptions or methodological adjustments applied

Step 4 – Data Entry in the BT

Once identified, data should be entered in the Excel based BT for the relevant year(s).

- Quantitative indicators are recorded using numerical values
- Each indicator in the Excel based tool has a text option to describe further and add more qualitative information.
- Where possible, data for multiple years should be included to allow longitudinal analysis.

Step 5 – Analysis and Interpretation

The BT results should be examined in relation to the original purpose and scope. This may include:

- Diagnosis of the AKIS
- Internal comparison over time to monitor change and trends
- Incorporation of qualitative notes to provide context and explain variations

Step 6 – Discussion and Validation

Findings should be shared with relevant AKIS stakeholders for validation. This step may involve identifying strengths, weaknesses, and emerging trends, discussing potential strategies for addressing gaps, and cross-checking results with additional sources or expert opinions.

Step 7 – Application of Results

The insights gained through the BT process can inform strategic planning and policy development, programme design and intervention prioritisation and continuous monitoring, by repeating the benchmarking process at regular intervals.

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7. Conclusion

The development of the AKIS Benchmarking Tool has shown that benchmarking, when applied to complex multi-actor systems such as the AKIS, can serve as more than a one-off assessment exercise. Its value lies in enabling AKIS Coordination Bodies and other actors to maintain a living, evolving picture of their system, tracking changes, identifying patterns, and preserving institutional knowledge over time. By functioning as both an analytical framework and a repository, the BT supports evidence-based decision-making even in the face of shifting political, economic, or institutional contexts.

The process of co-creation has been central to this outcome. Iterative discussions within the Benchmarking Tool Working Group have ensured that the tool reflects both technical robustness and practical usability. This collaborative approach has helped balance the need for structured, comparable data with the flexibility required to accommodate the diversity of Member State contexts.

Looking ahead, the BT's real impact will depend on its integration into ongoing strategic and operational processes. Used consistently, it can foster a culture of reflection and learning within AKIS governance, helping actors to move from reactive responses toward proactive system development. In this way, the tool becomes not an endpoint, but a starting point for sustained improvement, providing the means to align knowledge, policy, and practice in support of a more innovative, inclusive, and resilient agricultural sector across Europe.

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8. References

Alstete, J. W. (2008). Measurement benchmarks or "real" benchmarking? An examination of current perspectives. *Benchmarking: An International Journal*, *15*(2), 178-186.

Alosani, M. S., Al-Dhaafri, H. S., & Yusoff, R. Z. B. (2016). Mechanism of benchmarking and its impact on organizational performance. International Journal of Business and Management, 11(10), 172-183.

Auluck, R. (2002). Benchmarking: a tool for facilitating organizational learning? Public Administration and Development: The International Journal of Management Research and Practice, 22(2), 109-122.

Aranda, C., Arellano, J., & Davila, A. (2017). Organizational learning in target setting. Academy of Management Journal, 60(3), 1189-1211.

Cakmak, B., Beyribey, M., Yildirim, Y. E., & Kodal, S. (2004). Benchmarking performance of irrigation schemes: a case study from Turkey. Irrigation and Drainage: The journal of the International Commission on Irrigation and Drainage, 53(2), 155-163.

Cristiano S., Proietti P., Birke, F. Deliverable 1.1 Conceptual and Methodological Framework for transformative/evolutionary AKIS journeys. Preprint at https://modernakis.eu/results-and-resources/ (2023).

Cole, M. J. (2009). Benchmarking: a process for learning or simply raising the bar?. Evaluation Journal of Australasia, 9(2), 7-15.

Engelkemeyer, S. W. (1998). Applying benchmarking in higher education: A review of three case studies. Quality Management Journal, 5(4), 23-31.

Ettorchi-Tardy, A., Levif, M., & Michel, P. (2012). Benchmarking: a method for continuous quality improvement in health. Healthcare policy, 7(4), e101.

EU SCAR (2012), Agricultural knowledge and innovation systems in transition – a reflection paper, Brussels.

Flesher, J., & Bragg, D. (2013). Evaluation and benchmarking module. Champaign, IL: Office of Community College Research and Leadership, University of Illinois at Urbana-Champaign.

Hogan, R. L. (2007). The historical development of program evaluation: Exploring past and present. Online Journal for Workforce Education and Development, 2(4), 5.

Jain, R., Yadav, O. P., & Pal Singh Rathore, A. (2008). The propagation of benchmarking concepts in Indian manufacturing industry. Benchmarking: An International Journal, 15(1), 101-117.

Kovačič, A. (2007). Benchmarking the Slovenian competitiveness by system of indicators. Benchmarking: An International Journal, 14(5), 553-574.

Longbottom David. 2000. Benchmarking in the UK: an empirical study of practitioners and academics. Benchmarking 7: 98–117.

Maire, J. L., Bronet, V., & Pillet, M. (2005). A typology of "best practices" for a benchmarking process. Benchmarking: An International Journal, 12(1), 45-60.

Malano, H. M., & Burton, M. (2001). Guidelines for benchmarking performance in the irrigation and drainage sector (No. 5). Food & Agriculture Organization.

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Ongosi, A. E., Magutu, P. O., Ongeri, R. N., Bosire, R. M., & Mogendi, T. A. (2020). A Survey on the Use of Benchmarking as a Continuous Improvement Tool for Ministry of Agriculture Parastatals in Kenya. European Journal of Business and Management Research, 5(6).

Price, C. P. (2005). Benchmarking in laboratory medicine: are we measuring the right outcomes?. Benchmarking: An International Journal, 12(5), 449-466.

Sarkis, J. (2001). Benchmarking for agility. Benchmarking: An International Journal, 8(2), 88-107.

Vorhies, D. W., & Morgan, N. A. (2005). Benchmarking marketing capabilities for sustainable competitive advantage. Journal of marketing, 69(1), 80-94.

Wollmann, H. (2017). Policy evaluation and evaluation research. In Handbook of public policy analysis (pp. 419-428). Routledge.

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