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AGRICULTURE & INNOVATION

# Agricultural Knowledge and Innovation Systems

Stimulating creativity and learning



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## Thinking out of the box to co-create and share knowledge

Approaches to knowledge exchange, learning and innovation in agriculture are rapidly evolving. Inevitably, everybody involved in farming, advising, research, training and education is facing a number of challenges in order to adjust to this moving context.

In the past, it may have appeared sufficient to work on solutions in a research environment and then pass them on to the farmer. Nowadays, new and better ways to share knowledge and expertise are essential to keep agriculture and food production competitive and rural areas vibrant in the 21st century. Thanks to the EIP-AGRI “interactive innovation model”, knowledge is now co-created by farmers, scientists, advisers, enterprises, NGOs, etc. The term **Agricultural Knowledge and Innovation Systems (AKIS)** is used to describe the whole knowledge exchange system: the ways people and organisations interact within a country or a region. AKIS can include farming practice, businesses, authorities, research, etc. and can vary a lot, depending on the country or sector. When developing new AKIS, technical, organisational and social dimensions should be taken into account (a “systems approach”), this helps bridge the gap between science and practice.

The EIP-AGRI aims to promote farmer-led interactive innovation projects and close the gap between research and practice. DG Agriculture and Rural Development organised the EIP-AGRI seminar ‘Promoting creativity and learning through agricultural knowledge systems and interactive innovation’. It drew attention to the importance of a move towards improving AKIS and highlighted some practical examples of the changes taking place regarding knowledge exchange, learning and innovation in the agricultural, forestry and rural development sectors.

This brochure provides examples, tools and tips for farmers, advisers and researchers from this seminar wishing to improve the way they work together, and to make EU farms more profitable, sustainable and productive.

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## ► AKIS 1.0: Understanding how knowledge flows support the agricultural sector

The concept of Agriculture Knowledge and Innovation Systems (AKIS) is used to describe how people and organisations join together to promote mutual learning, to generate, share, and use agriculture-related knowledge and information. A great diversity of people is involved in creating agricultural knowledge. Farmers, advisers, researchers, education and training providers, input suppliers, retailers, media services, ministries are all part of a national or regional AKIS since they all either need, produce or exchange knowledge. This is the current situation (or "AKIS 1.0"). The collaboration between the diverse groups could still be improved much further: more interaction and cross-fertilisation will fuel innovation and impact.

The relationship between farmers, society and the natural world is changing due to diminishing resources, growing populations and pressure on the environment, changing societal expectations, new technologies and the increasing impacts of climate change. The future of agriculture and the organisation of the food chain from producer to consumer will be very different. What is more, non-food agricultural issues are becoming

increasingly important. It is for these reasons that farmers and foresters need new knowledge, new skills and innovative ideas to develop and manage smarter and more sustainable production systems.

The **PROAKIS** project describes the types of AKIS which are the most effective for creating connections and supporting knowledge flows. Farmers need to have continuous access to reliable and relevant knowledge sources to be able to innovate, successfully solve problems and respond to new opportunities for development. The project illustrated the importance of improving the structure and organisation of national and regional AKIS to speed up innovation.

Find out how knowledge and innovation systems and advisory services are developed in your country: [www.proakis.eu](http://www.proakis.eu).



An overview of European AKIS (2014) - source PRO-AKIS report



source PRO-AKIS report



## ► AKIS 2.0: Building a future knowledge exchange system adapted to farmers' needs

In the 21st century, the 'linear knowledge transfer' model - where researchers, trainers and technical experts develop solutions to agricultural problems and then pass them down to farmers - is becoming increasingly outdated. Peer-to-peer learning between farmers is more and more important and advisers are starting to work with interactive methodologies to better support innovation and change. New forms of media and information technology are also providing exciting new possibilities for co-creating knowledge and sharing the expertise needed to tackle the complex challenges we now face. Knowledge systems need an update: an "AKIS 2.0".

New approaches to **exchanging knowledge** take time to become fully established. New skills are needed to make wise and effective use of new communication channels. Language barriers exist and in many cases there are still gaps between research, advice and practice which block the two-way flow of information that is needed to foster innovative solutions to farming needs and opportunities.

Everyone involved in agricultural knowledge systems needs to focus on the real issues that farmers face. This way they will deliver feasible solutions which farmers are motivated to implement and from which they will benefit.



### Tips for researchers and research managers

- Promote interaction between research and practice
- Make research more responsive to farmers' needs and context
- Reward researchers for engaging more with farmers

### Tips for advisers

- Tailor your advice to farmers' changing needs
- Improve links with research
- Act independently and be trustworthy

### Tips for trainers

- Make sure the opportunities for lifelong learning are better known and more accessible to all farmers
- Promote more peer-to-peer learning and informal knowledge exchange amongst farmers
- Foster more innovation in agricultural education and training

### Tips for companies

- Develop better understanding and create win-win partnerships between farmers and business/industry

### Tips for networks and media

- Make better use of networks for informal knowledge exchange
- Improve coverage of agricultural issues by mass media and put agri-innovation in the spotlight
- Ensure better quality information about farming issues in farming media

### Tips for public authorities

- Build soft and hard infrastructure promoting knowledge exchange among researchers, advisers and practice
- Invest in independent advisory services which encourage trust



New tools and approaches are already being used across Europe to improve knowledge exchange, learning and interactive innovation in the agricultural, forestry and rural development sectors. The agricultural community is becoming more creative and resourceful. Valuable success stories are being shared through channels ranging from social media to networks created for and by farmers. Approaches such as benchmarking farm performance are helping farmers to adapt and improve the management of their farms. The following pages present some examples as inspiration.

## ► Building multi-actor knowledge networks for farmers

There are a growing number of practical 'knowledge networks' providing knowledge for farmers. For instance, Thematic Networks financed by Horizon 2020 which focus on compiling and disseminating best practices and useful research findings to farmers in easily-understandable language. Farmer-led "platforms" exchange new knowledge and innovations for practical uptake and further adaptation.

More knowledge networks – both formal and informal – producing relevant information for farmers are needed. The integration of these knowledge networks into the regional or national AKIS is essential. Read the [EIP-AGRI brochure Thematic Networks under Horizon 2020](#) (EN - FR - HU - ES).

### Teagasc: Delivering an integrated package of knowledge, information, advisory and training - Ireland



*"Agricultural extension has changed from advising farmers to helping farmers learn from other farmers"* Tom Kelly, Director of Knowledge Transfer, Teagasc and Chairman of EUFRAS

Teagasc - the Irish Agriculture and Food Development Authority - is convinced that knowledge networks must be integrated in the Irish AKIS. Their holistic approach combining advice with research and education while also involving other stakeholders and organisations is key. They lead knowledge programmes responding to farmers' needs and train and support other providers of agricultural information. The Teagasc **ConnectEd** programme provides access to publications, training and support tools for professionals, with corporate and small business membership options for agriculture and food networks. They subcontract services and partner with other knowledge providers to expand their network and share know-how. The Teagasc network includes a large variety of people such as: industry partners, agricultural consultants, commercial advisers, farming media, farmer organisations. Teagasc supports farmer benchmarking tools and discussion groups, helping to monitor and motivate change, and in this way encourage farmers to adopt new technologies.

More information: [www.teagasc.ie](http://www.teagasc.ie)



### ► Farmer-to-farmer knowledge exchange

Just like any entrepreneur, most farmers are used to solving their own problems. Farmers naturally tend to experiment. They fully understand the specific situation of their farm and are constantly adapting their farming systems to improve productivity and profitability. But when farmers trial or test, they often do it alone because agricultural research does not sufficiently focus on specific farming needs. Exchanging with another farmer can however lead to breakthroughs in addressing challenges.

#### Earthworms versus machines - France



Jean Hamot, a French arable farmer had problems on his farm with erosion and loss of good soil structure caused by the use of machinery. In 1996 he met farmer-colleague Frédéric Thomas who used conservation agriculture techniques: a set of soil management practices that minimise the disruption of the soil's structure, composition and natural biodiversity. Inspired by Thomas, Hamot consulted agricultural magazines and web-based resources to learn more about conservation agriculture. Hamot: "While testing several soil management methods, I also grew into this way of working. So I stopped ploughing my fields every year and converted to conservation agriculture. I now prefer to use crops and crop residues to protect the soil, and earth worms doing the natural tillage instead of machines." The soil structure on his 200 hectare of fields is now improved by plant roots, earthworms and soil cover. He therefore saves on mechanical tillage, and he noticed that this approach is also benefiting the wildlife on his farm.

More information: [presentation at EIP-AGRI seminar Knowledge systems](#)

Many countries have specific national/regional programmes to stimulate peer-to-peer learning among farmers. In 2017, two multi-actor Horizon 2020 projects started making an EU wide inventory of this peer-to-peer learning on demonstration farms. It is key to encourage face-to-face and on-field activities: convincing farmers to change practices does not work well if the networking is only web-based. The inventory of demonstration farms will be useful for all Operational Groups and Horizon 2020 multi-actor projects. For more information:

- **AgriDemo-F2F** - Building an interactive AgriDemo-Hub community: enhancing farmer to farmer learning: [CORDIS \(2016\) - project website](#)
- **PLAID** - Peer-to-Peer Learning: Accessing Innovation through Demonstration: [CORDIS \(2016\) - project website](#)

## ► Farmer-led interactive innovation



### Field laboratories for innovative farmers - UK

In 2012, the “Duchy Future Farming” Programme was set up in the UK to provide research support and grants to groups of farmers, enabling them to carry out practical ‘field labs’. Over three years, more than 750 farmers took part in field labs on 35 topics. In 2015, the Soil Association built on the programme’s experiences to create an “Innovative Farmers” membership network of farmers working together to find lasting solutions to practical problems. Innovative Farmers provides professional support and access to a dedicated research fund. The funders aim to award more than £800,000 to farmer groups by 2020, allowing farmers to investigate techniques that will really make a difference on the ground. The Soil Association also functions as an innovation support service helping groups apply for funding such as EIP-AGRI Operational Groups. The Soil Association acts as a match-maker, forming new groups and making connections according to compatibility. Currently the Soil Association is contracted by the National Rural Network in Scotland as innovation support service.

Kate Pressland, Programme Lead for Innovative Farmers, explains: “Farmers and researchers work together to find sustainable solutions to problems in agriculture. Farmers learn from researchers about good experimental design and what the scientific arena already knows on the issue, whilst simultaneously farmers help researchers understand the real priorities they have to face. Advisers help coordinate groups and farming organisations can get their own network of farmers involved. There has been great interest in this pragmatic and cooperative way of tackling the challenges agriculture has.”



More information: [www.innovativefarmers.org](http://www.innovativefarmers.org)



### Practical tips for innovation support services

- Direct interaction with other farmers combined with seeing practical examples of good practice/successful alternatives plus up-to-date information on profitability can encourage farmers to expand their knowledge and test new farming methods
- Integrated approaches tend to work best: combine face-to-face, on-farm contact with web-based exchange of information. However, avoid relying only on web-based networking, it is usually less effective than live contact and peer-to-peer exchanges. Group meetings must be well-prepared: poorly organised meetings quickly lose interest and credibility from the participants
- Good solutions “created by farmers for farmers” spread quickly
- Farmer groups can attract various sources of funding, especially on innovative topics – be creative!



### Tips to find, share and co-create on the EIP-AGRI network website

- [Find interesting projects](#) that might have already found a solution to your problem
- [Share a project idea](#) that you have
- [Share your practical needs](#)



### ► Innovative agricultural media

Agricultural journalism is changing and new, alternative media are being used to communicate information for and about farmers. In particular, there has been a big increase in the use of on-line videos which are proving very useful to address the information gaps that exist between research and practice, and between farmers and consumers. Also farmers can take the initiative and start up an innovative approach to reach people.

#### **MyKuhTube online videos connect consumers and farmers - Germany**



20 dairy farmers in Germany have been using online videos since 2013 to share and communicate the reality of their day-to-day lives on the farm. Every week, two videos are posted on [www.mykuhtube.de](http://www.mykuhtube.de) - "kuh" meaning "cow" in German. This initiative is run by the Lower Saxony Association of Milk Producers. My KuhTube is a true "Kuhcommunity" with almost 3000 subscribers to their YouTube channel.

Through the videos you can accompany the farmers in their daily work. You learn about new technologies, tried and tested techniques and solutions to common problems. But you also meet their families, you get to know their cows and you find out what it is like to be a dairy farmer in the region.



Amos Venema, one of the dairy farmers/film makers, says "I believe that we dairy farmers as modern business men/women have to show how we live with, for and from our cows to have a better understanding by the consumer. It is important that urban people learn more about rural culture and sustainable dairy farms."

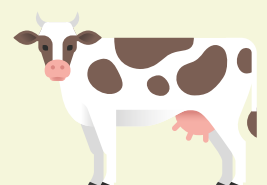
Amos says that since he has been posting videos on My KuhTube, he has seen a positive impact for him including an increase in the number of people coming to his farm's open days, and his farm has featured over 500 times in print media, in 20 TV reports and 30 radio reports and one of his videos for example has reached 150,000 clicks on YouTube.

More information: <https://www.youtube.com/user/mykuhtube>



#### **Practical tips for movie makers**

- Limit your videos to one topic and make them as short as possible (maximum 3 minutes)
- Avoid the use of over-complicated language: keep things clear and simple
- Choose a good title and teaser for your video in order to attract people to watch







### ► Social media by and for farmers

Social media, such as Twitter, Facebook, Pinterest and Snapchat, are increasingly used by farmers. They share ideas, discuss pressing issues, debate hot topics or simply connect and exchange knowledge with people who they may not otherwise have access to, such as European level organisations. Joining or starting an online knowledge network will help farmers rapidly and broadly connect with peers.

#### #Twitter #Meeting #AgriChatUK - UK



Every Thursday evening, the online Twitter community #AgriChatUK invites farming professionals to talk about important questions that need a practical solution. Farming professionals such as farmers, consultants, academics can both ask questions and provide answers. Simon Haley from AgriChatUK tells: "It's simple and quick. By adding the hashtag #AgriChatUK to your message on twitter, other professionals can pick up your question immediately and provide you (if available) with their view on a solution or give additional information or links."

More information: <http://www.agrichatuk.org>



#### Practical tips for social media starters

- Do not use over-complicated language: keep things clear and simple
- Take care to avoid mistakes and avoid communicating wrong information - you will quickly lose credibility
- Try to choose the most appropriate social media channels for your specific needs or interests. There is a difference between private and professional use
- Use a catchy hashtag or take pictures, this really helps to get attention and focus communication
- Don't expect everyone to contribute to discussions. Some people will simply participate to gather information or find out new ideas, opinions and perspectives



#### Tips to find, share and co-create through EIP-AGRI social media

- Follow the EIP-AGRI on [Twitter](#) and [LinkedIn](#)
- Share or ask a question, mentioning @EIPAGRI\_SP on Twitter
- Join the [Horizon 2020 Partner search group](#) on LinkedIn





### ► Benchmarking for better farm performance

Benchmarking allows farmers to compare their own farm's results with those of similar farms. The dimensions that are usually measured are quality, time and cost. Best practice farms are identified and compared with the results and processes of the other farms studied, this is known as 'benchmarking'. This way, farmers learn how well they perform and, more importantly, why certain farms are successful. Benchmarking is an important tool to exchange knowledge and improve the productivity and sustainability of farms, and it can be an innovative tool for advisers.

#### Benchmarking in farmer discussion groups - Finland



A private advisory initiative in Finland is helping farmers improve their farm performance. About 10 farmers compare different farmers' best practices in discussion groups to improve results. The discussion group leaders are the key persons in this exchange of knowledge. They inform the farmers about new research results, case studies from the best farms and encourage the farmers to tell more. Trust and open minds in a group help the farmers to learn more about their own practice from the other farmers.

The group collects data, finds the best practices and searches for positive changes on a specific topic. The target is to save time and get better farm results. Every group starts from the big picture of each farm, searching for the critical points. Once set, the group works to overcome the critical points for the next 1-1.5 years. During that period, everyone makes the summary on what the best ones have achieved and what they could do themselves. The final summary describes what they actually did and how their results have changed because of it.

More information: [www.proagria.fi](http://www.proagria.fi)



#### Tips to find, share and co-create - EIP-AGRI Focus Group on benchmarking

The [EIP-AGRI Focus Group on Benchmarking](#) explored the potential for farmers and advisers to use farm benchmarking data and processes to improve productivity and sustainability performance in agriculture.

More information in the [EIP-AGRI Factsheet on Benchmarking](#).



### ► Thinking out of the box

Sometimes existing approaches do not provide the solutions you need. Throwing all the usual rules, structures and practices overboard may help to find new perspectives and think differently to come up with a new, unexpected, innovative solution to your challenge.

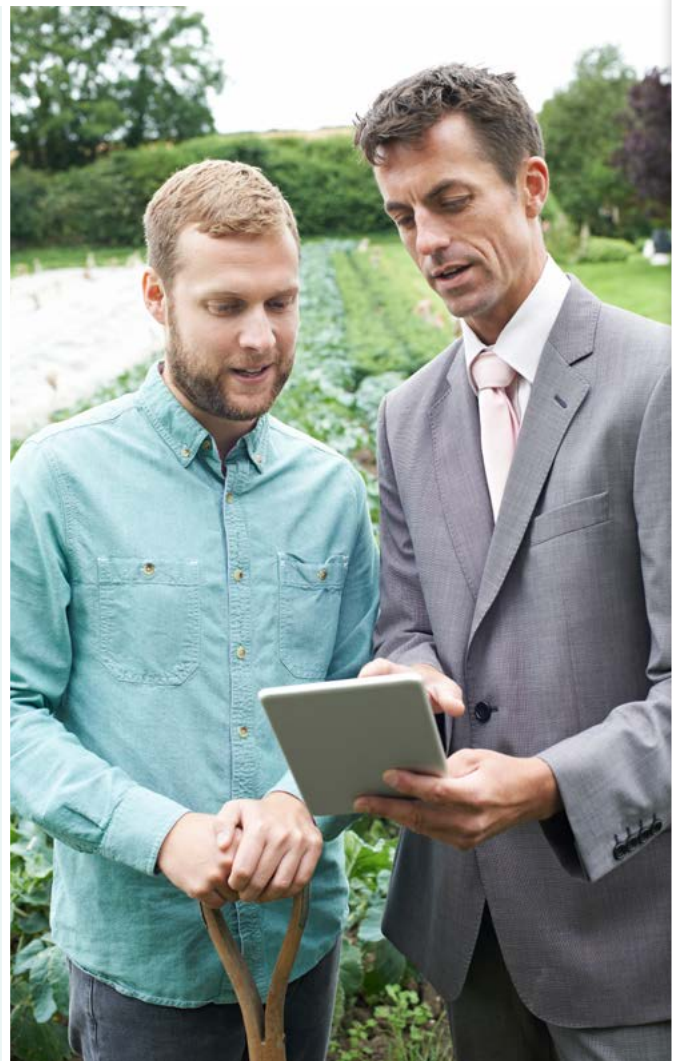
#### The ultimate cheese board - Belgium



In 2011 the time came that a goat farm in Belgium wasn't sure if their farm would be able to survive. Encouraged by the initiative of the Flemish Innovation Support Centre, they decided to invite an advisory board composed of external experts to bring in new ideas and information. Board members included the CEO of a biscuit factory, a hospital manager and a retired cheese factory CEO. As a result of this initiative, the farmers ended up making drastic changes which they would not have made without the support and calculations of the board.

Today, the company is thriving: 600 goats provide milk for natural and artisanal cheeses that are free from additives. At the farm, there is a farm shop where products can be purchased all year round, and from April to September visitors can also enjoy a goat's milk ice cream or drink on their summer terrace.

More information: [www.polle.be](http://www.polle.be)



# Improving Agricultural Knowledge and Innovation Systems (AKIS) supporting farmers

