



Addressing the current and **Future** skill needs for sustainability, digitalization, and the bio-**Economy** in Agriculture: European skills agenda and **Strategy**.

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Sustainability Digitalization Bioeconomy in Agriculture

There are new challenges and opportunities for agriculture today, driven by the climate change, the greening of the products and processes, the reuse of side-stream products, the raised complexity of the chain and the increased availability of information.

However, to successfully address and react to these drivers, agriculture and forestry needs new business models and skills. The identification of existing and emerging skills needs in bio-economy, sustainability and for the use of digital technology, is of paramount importance in order to develop a strategic approach to keep the European agricultural sector competitive and sustainable in the long term.

The multi-stakeholder approach in the FIELDS project, with 30 partners from 12 countries (HEI, VET providers, agricultural and forestry sector representatives and agri-food industry) allow tackling the complexity of the issues EU agriculture faces today.

The project designs strategies to provide knowledge transfer through training at EU and country level, to reach both people in initial training and farmers. Learners will be engaged with modular innovative training, flexible schedule, and the possibility to take only the skills they need.

FIELDS project takes an innovative approach to analyse the skill needs, through scenarios analysis, focus groups, innovative curricula including state of the art or new methodologies will be designed.

FIELDS goal is to delivery human capital solutions to supply food systems and bioeconomy chains, through the establishment of an Agriculture and Forestry Sector Skill Alliance. The action will provide analysis of skill gaps for bioeconomy, digitalisation and sustainability, EU and country strategies, curricula, apprenticeship schemes, modular training material and opportunities to implement further the skills after the project ends.

In FIELDS project, focus groups aim at identifying skill needs and future trends in agriculture, forestry and related sectors, by collecting information and qualitative data about:

1

- Identified needs in agriculture and forestry. Needs will be classified into 4 main categories: sustainability, digitalisation, bio-economy and soft skills.

2

- Industry needs (extrapolate skills needed in agriculture and forestry-based also on industry needs).

3

- Existing training in response to identified needs, and missing training for the identified needs.

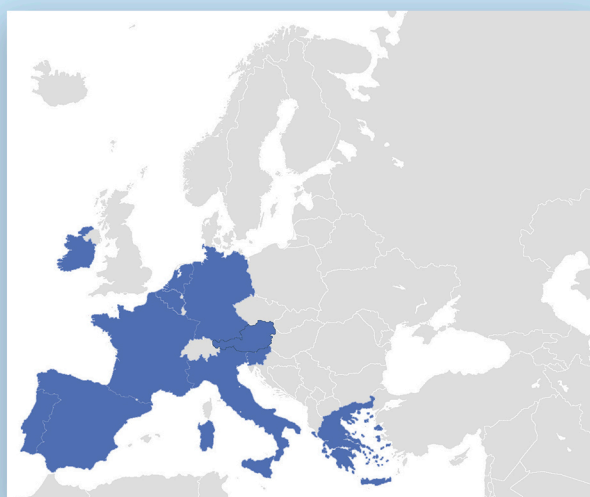
4

- Identified target groups for training and curricula definition.

5

- Best methods to deliver training to each target group.

NATIONAL FOCUS GROUPS have been celebrated in each consortium country: **Austria, Belgium, France, Germany, Greece, Italy, Ireland, Netherland, Slovenia and Portugal/Spain**, involving relevant stakeholders drawing an overall view of the sector, of its future needs and identifying the current and future skills gaps and training needs, to prepare to more suitable training modules.



FOCUS Groups PARTICIPANTS

| | Italy | Ireland | Spa/Por | Neder. | Austria | Germany | Greece | France | Slov. | Forestry |
|------------------------|-------|---------|---------|--------|---------|---------|--------|--------|-------|----------|
| Farmer | 1 | 2 | 1 | 1 | 1 | | 1 | 2 | 2 | |
| Cooper. | 1 | 2 | 2 | | 2 | 1 | 1 | | 1 | 2 |
| Agri-food comp. | 2 | 2 | | 1 | 1 | 1 | 1 | 1 | 1 | |
| Education | 5 | 3 | 2 | 3 | 4 | 1 | 2 | 3 | 3 | 4 |
| Advisors | | 2 | 3 | 2 | 1 | 1 | 1 | | 1 | 5 |
| Foresters | 1 | 1 | | 1 | | | | | | 2 |
| Forest. ind | | | | | 1 | | | | | 2 |
| Other* | 3 | 1 | 2 | | | 3 | | 3 | | |

*Mainly researchers and Governmental agencies

| Skill | Citations |
|-----------------------------------------------------------|-----------|
| Quality management, quality assurance and quality control | 7 |
| Farm Management Information System (FMIS) | 7 |
| Efficient use of resources and logistics | 5 |
| Everyday usage of digital technology to communicate | 5 |
| Organisation, planning, visioning and strategic thinking | 5 |
| Data handling and analysis | 4 |
| Communication | 4 |
| Project management | 4 |
| Mitigation and adaptation to climate change | 4 |
| Fields operations management systems | 4 |

| Skill | Citations |
|---------------------------------------------------------------------------------------------------|-----------|
| Business planning/model and strategic management | 7 |
| Mitigation and adaptation to climate change | 6 |
| Soil Nutrient and Health Management | 6 |
| Good Agricultural Practices | 6 |
| Communication | 5 |
| Everyday usage of digital technology to communicate | 4 |
| National, EU and international environmental policies, regulation, subsidy and support programmes | 3 |
| By-products and co-products valorisation | 3 |
| Generation, storage and use of renewable energies | 3 |
| Performing farming operations | 3 |

| Skill | Citations |
|-----------------------------------------------------------------------|-----------|
| Water management | 5 |
| Business planning/model and strategic management | 5 |
| Good agricultural practices | 4 |
| Digital irrigation control systems | 4 |
| Conventional versus /and organic farming | 4 |
| National, EU and international environmental policies and regulations | 3 |
| Generation, storage and use of renewable energies | 3 |
| New industrial crops and bioproducts for the bioeconomy | 3 |
| Communication | 3 |
| Innovation management and its deployment on-site | 3 |

- ITALY

The Entrepreneur will have to worry not only about Food Production and Profit but also about Innovation, E-commerce, Digitalisation and Logistics. Especially for small farm/companies, it would be crucial to have an Innovation Broker who would help them evolve and who would create a network of expertise around them.

- IRELAND

Sustainability skills where those most cited in the skill rankings: mitigation & adaptation to climate change, soil nutrient and health management, good agricultural practices...The most preferred training methods were practical approaches such as learning on the job, mentoring, coaching, challenge-based and collaborative learning.

- SPAIN / PORTUGAL

Adequate legislation, planning and water management as well as good agricultural practices are essential to guarantee food production and the sustainability of agriculture in Europe, and especially in southern countries, where without irrigation aid would not be possible to achieve viable and sustainable agriculture, both economically and socially.

| Skill | Citations |
|----------------------------------------------------------|-----------|
| Sustainable forest management practices and planning | 4 |
| Business planning/model and strategic management | 4 |
| Soil nutrient and health management | 3 |
| Planning and coordinating production | 3 |
| Ethics for food | 3 |
| Organisation, planning, visioning and strategic thinking | 3 |
| Basics of financial issues | 3 |
| New value chains / new business models | 3 |

| Skill | Citations |
|-----------------------------------------------------|-----------|
| Communication | 6 |
| Everyday usage of digital technology to communicate | 5 |
| Business planning/model and strategic management | 5 |
| Analytical, critical and creative thinking | 3 |
| Being resilient, adaptable and proactive | 3 |
| Basics of financial issues | 3 |
| Funding opportunities | 3 |
| Project management | 3 |
| Data handling and analysis | 3 |

| Skill | Citations |
|----------------------------------------------------------------|-----------|
| Efficient use of resources and logistics | 4 |
| By-products and co-products valorisation, | 4 |
| Business planning/model and strategic management | 4 |
| Collaboration/cooperation across all sectors in the food chain | 4 |
| Good agricultural practices | 3 |
| Everyday usage of digital technology to communicate | 3 |
| Communication | 3 |
| Interdisciplinary knowledge to assess the whole value chain | 3 |

| Skill | Citations |
|----------------------------------------------------------------------|-----------|
| Business planning/model and strategic management | 3 |
| Efficient use of resources and logistics | 2 |
| National, EU and international environmental policies, regulation... | 2 |
| Good Agricultural Practices | 2 |
| Water management | 2 |
| Conventional versus /and Organic farming | 2 |
| Learning continuously (lifelong learning) | 2 |
| Cooperatives (values, legal framework and management) | 2 |
| Collaboration/cooperation across all sectors in the food chain | 2 |
| Funding opportunities | 2 |

| Skill | Citations |
|---------------------------------------------------------|-----------|
| Mitigation and adaptation to climate change | 7 |
| By-products and co-products valorisation | 5 |
| Digital tools to support learning and distance learning | 4 |
| Good Agricultural Practices | 3 |
| Data protection | 3 |
| Robot and drone technology | 3 |
| Crop diversification and rotation | 3 |

- NETHERLANDS

Bio-economy skills were by far those most cited in the skills rankings, as examples: “sustainable forest management practices and planning”, “planning and coordinating production” and “ethics for food”.

- AUSTRIA

There was an underlying sentiment reflecting that communication – independent of the job position - comes first. There were also interesting comments on knowledge and value chains, i.e. the overall understanding of value chains: It is of utmost importance to understand and to know, what the others are doing, due to increasing specialization.

- GERMANY

A great deal of basic knowledge on digital skills is still lacking and, as a result, many farmers are afraid to use new technologies. A cultural change in companies can already be seen to implement more skills aiming at interdisciplinary work and lower hierarchies.

- GREECE

Business-entrepreneurship (e.g. business planning/model and strategic management) and bio-economy skills (e.g. conventional versus /and organic farming) were the most cited in the skill rankings.

- FRANCE

Fluency in English emerged as a key skill for all participants, although it was not mentioned anywhere in the skill sheets. Beyond the technical skills, the participants insisted on the importance of the soft skills which are key in any type of job, while the technical skills can be acquired more easily throughout the career.



| Skill | Citations |
|----------------------------------------------------------|-----------|
| Everyday usage of digital technology to communicate | 4 |
| Being resilient, adaptable and proactive | 4 |
| Mitigation and adaptation to climate change | 3 |
| Active management of natural resources | 3 |
| By-products and co-products valorisation | 3 |
| Planning and coordinating production | 3 |
| Communication | 3 |
| Organisation, planning, visioning and strategic thinking | 3 |

SLOVENIA

There is a lack of soft skills and that they need to be especially enhanced. Too little emphasis is given to strategic thinking, which means we focus too much on the present or on some short-term survival decision-making.

FORESTRY

| Skill | Citations |
|-------------------------------------------------------------------|-----------|
| Sustainable forest management practices and planning | 10 |
| Multifunctional forests and ecosystem-services | 6 |
| Forest disease control and prevention | 6 |
| Everyday usage of digital technology to communicate | 6 |
| Prevention and management of natural disturbances | 5 |
| Mitigation and adaptation to climate change | 5 |
| Reforestation, afforestation and restoration of forest ecosystems | 4 |
| Water management | 4 |
| New value chains / new business models | 4 |
| Biodiversity | 4 |

In the future, a pressing number of skills will become increasingly relevant, for instance:

- Risk Management skills, such as Prevention of Natural Disturbances, Forest Disease Control and Prevention
- Sustainability skills, such as the Efficient Use of Resources, Sustainable Planning, Water Management, Development of New Resource-Efficient Products and Improved Waste Management.

Based on the views of most participants, digital training and online courses will expand further in the near future, as online platforms are very distance-efficient and time-efficient. However it was stressed the fact that experience on the ground is absolutely important as there are some practical things can't be taught online.

Combining company efforts with academic institutions is a priority as learning-by-working through trainee positions with Universities is an easy way to get new ideas or up to date ideas from students or trainees. Also, strategic mentorship programs within big companies and on-the-job training have been proved very valuable tools to ensure knowledge transfer.

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