

# Research needs from practice



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# 1. Why collect research needs from practice?

Many research results are only slowly translated into practical applications, or not at all. In addition, professionals such as farmers and foresters may have the impression that research does not meet their needs. Identifying 'research needs from practice' can help solve this, by facilitating dialogue between researchers and those that can use research results in practice.

This report follows the internal Methodological Approach document (updated October 2022), which defines a 'research need from practice' as:

- › a challenge that professionals from the farming and forestry sectors (such as farmers, foresters and advisors) and other relevant rural actors come across in their daily work, and for which multi-actor research projects or innovative EIP-AGRI Operational Group projects may provide solutions.
- › a possible solution for a problem or challenge, or a new method identified in practice by a farmer, forester, advisor, or other relevant rural actor, including agribusiness, which needs further development or research, or the development of a methodology if the solution needs to be implemented on a broader scale.
- › new knowledge and/or an innovative solution discovered by a farmer, forester, advisor, or any other relevant rural actor, including agribusiness or non-food sectors, which could benefit from research or innovative projects to improve or commercialise the solution or allow it to be applied or adapted elsewhere.

The 'Support Facility for Innovation and Knowledge exchange | EIP-AGRI' collects research needs from practice during workshops, seminars, Focus Group (FG) meetings and other networking activities, through activity reports of agricultural or forestry organisations. Research needs were also collected via a dedicated [online form](#) on the EIP-AGRI website<sup>1</sup>.

The collected research needs from practice were published on the [EIP-AGRI website](#). All research needs will in the future be published and become searchable on the [EU CAP Network website](#). By making the research needs visible via the EU CAP Network website, anyone with an interest in the same issue, including researchers, farmers or other practitioners, can review them and provide an answer to the identified problems. Interested parties can also decide to take up a question and try to solve it, for instance by setting up an innovative project with other partners.

The collected research needs will also become visible to national and regional policy makers and authorities, who may decide to take up specific topics in their calls for innovative projects. Information from the research needs also feeds into the programming of European Research and Innovation activities.

## 2. Scope of this summary report

This report takes into account the outcomes of a number of EU CAP Network Focus Groups, workshops and seminars. Several reports of events that were organised by the EIP-AGRI Service Point during the previous programming period were also reviewed for research needs from practice that may not have been highlighted before. This report also includes research needs identified in three EIP-AGRI Focus Groups that completed their work in 2021-2022, and in the EIP-AGRI workshop 'Conversion to Organic Farming' (June 2022).

Apart from research needs from practice that were identified in EIP-AGRI Focus Groups, no research needs were submitted through the online form since April 2021. This report covers the period between January 2020 – December 2022. It comprises research needs derived from the following sources:

- › FG 38 on 'Reducing antimicrobial use in poultry farming' ([final report](#))
- › FG 39 on 'Wildlife and Agricultural Production' ([final report](#))
- › FG 40 on 'Sustainable industrial crops in Europe: New market opportunities and business models which do not replace food production' ([final report](#))
- › FG 41 on 'Reducing the plastic footprint of agriculture' ([final report](#))
- › FG 42 on 'Sustainable beef production systems' ([final report](#))
- › FG 43 on 'Climate-smart (sub)tropical food crops in the EU' ([final report](#))
- › EIP-AGRI Workshop 'Opportunities for agriculture and forestry in the circular economy' ([final report](#))
- › EIP-AGRI Workshop 'Building new biomass supply chains for the bio-based economy' ([final report](#))
- › EIP-AGRI Workshop 'Opportunities for farm diversification in the circular bio-economy' ([final report](#))
- › EIP-AGRI Seminar 'Turning forest innovation into practice' ([final report](#))
- › EIP-AGRI workshop 'Farm data for better farm performance' ([final report](#))

<sup>1</sup> Since the EIP-AGRI Network has become part of the EU CAP Network, the EIP-AGRI website is no longer being updated (1 April 2023). It remains available in a static form as a reference of all previous EIP-AGRI activities. All publications and all new and up-to-date information, including the research needs from practice, will become available and searchable on the [EU CAP Network website](#) in the near future.



- > FG 44 on 'Digital tools for sustainable nutrient management' ([final report](#))
- > FG 45 on 'Sustainable ways to reduce pesticides in pome and stone fruit production' ([final report](#))
- > FG 46 on 'Nature based solutions for water management under climate change' ([final report](#))
- > EIP-AGRI Workshop 'Conversion to organic farming' ([final report](#))

This report includes 122 research needs from practice. All of them have been cross-checked<sup>2</sup>.



### 3. Analysis per strategic priority for research and innovation

Following the European Commission's strategic approach for EU agricultural research and innovation, the research needs in this report have been clustered according to key priority areas for research and innovation.

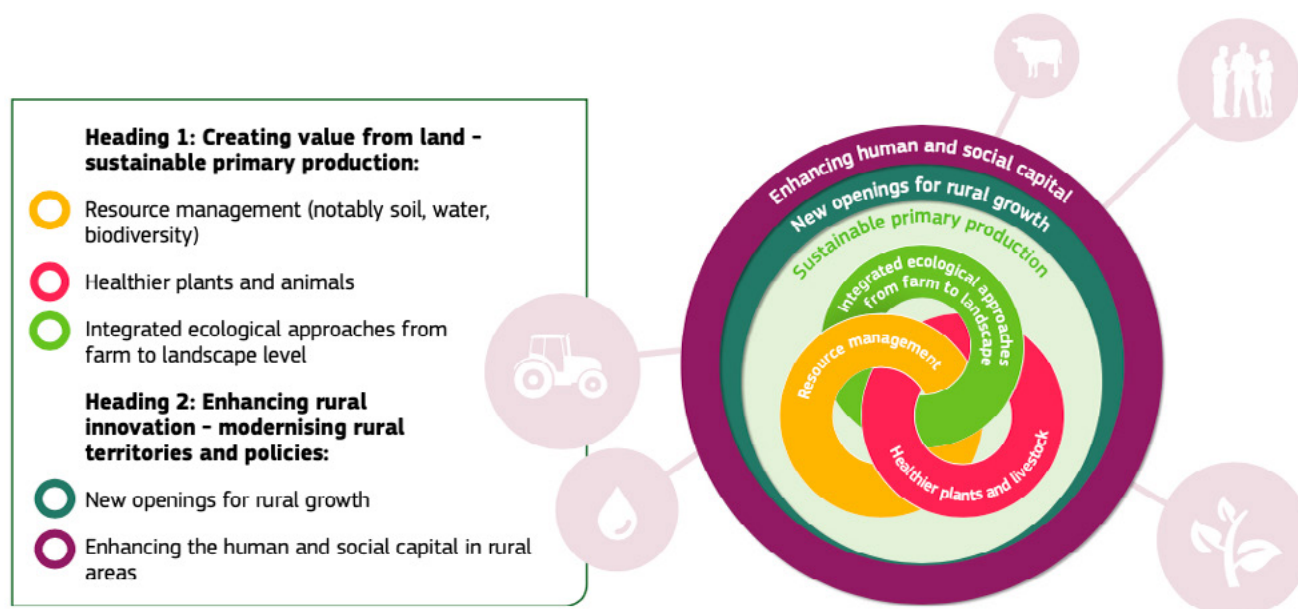


Figure: Priority areas in the European Commission's Strategic Approach for EU Research and Innovation (Source: <https://ec.europa.eu/news-room/horizon2020/items/33294/en>)

<sup>2</sup>The identified research needs have been cross-checked and validated by participants of Focus Groups, workshops and seminars, to see if they are indeed research needs that are relevant for farmers, foresters, agribusiness and other rural people and enterprises, preferably in more than one geographical area in Europe. In some networking activities, cross-checking is inherently built in.



For this report, the key research areas have been grouped per strategic research priority, as follows (Table 1):

**Table 1. Key research areas per strategic research priority**

<b>Strategic research priority:</b> Creating value from land - sustainable primary production	<b>Key research areas</b>
Resource management	Sustainable soil, land, water and nutrient management
	Biodiversity and genetic resources in agriculture and forestry
	Protein crops for sustainable agriculture
	Multi-functional forests for future generations
Healthier plants and animals	Healthy plants in an ever-changing environment
	Healthy animals for healthy people
Integrated ecological approaches, from farm to landscape level	Ecological approaches in land-based primary production
	Climate action in agriculture and forestry
	Sustainable livestock systems

<b>Strategic research priority:</b> Enhancing rural innovation - modernising rural territories & policies	<b>Key research areas</b>
New openings for rural growth	Small-scale, sustainable biofcbased systems
	Enabling digital and data technologies
Enhancing the human and social capital in rural areas	Agricultural Knowledge and Innovation Systems (AKIS) of the future
	Innovative policies, business models and value chains enabling sustainable food systems
	Rural and social dynamics: towards smart, green and inclusive rurality

\* Full information about the event, including detailed programme, booklet of speakers, videos and presentations can be found [on the event webpage](#)



In the following sections, all research needs from practice are presented per key research area. Table 2 below shows the total number of research needs that were identified for each key research area.

It should be noted that many research needs appear under more than one key research area. The figures below show that 122 research needs appear, on average, 2.76 times per key research area. This makes for a total of 337 cases.

**Table 2. Number of research needs cases, by key research area**

Key research area	Number of cases
<b><i>Resource management (Total: 93)</i></b>	
Sustainable soil, water and nutrient management	46
Biodiversity and genetic resources in agriculture and forestry	29
Protein crops for sustainable agriculture	2
Multi-functional forests for future generations	16
<b><i>Healthier plants and animals (Total:41)</i></b>	
Healthy plants in an ever-changing environment	18
Healthy animals for healthy people	23
<b><i>Integrated ecological approaches, from farm to landscape level (Total: 78)</i></b>	
Ecological approaches in land-based primary production	17
Climate action in agriculture and forestry	32
Sustainable livestock systems	29
<b><i>New openings for rural growth (Total: 57)</i></b>	
Small-scale sustainable biobased systems	32
Enabling digital and data technologies	25
<b><i>Enhancing the human and social capital in rural areas (Total:68)</i></b>	
Agricultural Knowledge and Innovation Systems (AKIS) of the future	13
Innovative policies, business models and value chains enabling sustainable food systems	31
Rural and social dynamics: towards smart, green and inclusive rurality	24
<b>Total number of cases</b>	<b>337</b>



### 3.1 Research needs related to creating value from land – sustainable primary production

Below, all research needs that are relevant to creating value from land and sustainable primary production have been grouped according to the three corresponding strategic priority areas 'resource management', 'healthier plants and animals', and 'integrated ecological approaches from farm to landscape level'. For each of these

strategic priorities, Table 3 presents the research needs per related research priority. As most research needs are relevant to more than one research priority, many will appear several times, here and in other tables below. For each research need from practice, its source is mentioned, with a hyperlink to the corresponding webpage.

**Table 3. Research needs that are relevant to key research areas related to creating value from land – sustainable primary production**

Resource management: Sustainable soil, land, water and nutrient management	
Research needs from practice	Source
Research need from Focus Group: How to evaluate the services provided by traditional systems	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Intensify research into systemic values of keeping animals	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Methane production variations between different breeds	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Involving farmers and foresters in the development of new processes and activities in the circular economy. The circular economy is a relatively new conceptual term in the agriculture and forestry sectors. The concept is also fairly complex to describe, often difficult to communicate and easily confused with other concepts, such as the bioeconomy.  Research is needed to understand how to involve farmers and foresters in the development of new processes and activities in the circular economy without it becoming an additional burden. It will be important to develop clearer and more practical language when engaging individuals in new approaches.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Understanding nutrient content from waste streams for use as inputs to the primary sectors. This should include the technical and agronomic characteristics, economic and environmental viability.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Research need from Focus Group: How to relate traditional systems of Outermost Regions (OR) to sustainability/services provided to develop labels	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Effect of manure and compost on soils and crops	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>



Research needs from practice	Source
Research need from Focus Group: Level of eco-efficiency of traditional practices combining crops and livestock to limit inputs	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Interregional or local projects in Outermost Regions (OR) to identify ways to intensify traditional systems in a sustainable way	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Robustness and animal efficiency	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Decision Support Systems on quantification and estimation of grass availability in quantity and quality	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Optimum sward management (grazing/cutting) for different species mixes	<a href="#">FG 42: 'Sustainable beef production systems'</a>
<p>Understanding synergies and trade-offs of ecosystem services, and setting priorities for provision of ecosystem services for different forests. Forests provide many different ecosystem services and their interrelations differ between these ecosystem services but also depending on local conditions.</p> <p>Although many ecosystem services have synergistic relations, there are always trade-offs so that not all can be provided to their optimum at the same time. It is therefore needed to set priorities, develop specific integrated management models, and increase awareness about this amongst policy makers, society, and practice.</p>	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Understanding nutrient content from particular waste streams for use as inputs to the primary sectors. There is a need to develop new initiatives for better understanding nutrient content from particular waste streams for use as inputs to the primary sectors. This should include the technical and agronomic characteristics, economic and environmental viability.	<a href="#">EIP-AGRI Workshop: 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Research need from Focus Group: Sustainable standards for cultivation and manufacturing of industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: End-of-life management of biobased material.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Better agronomic knowledge on the cultivation of aromatic crops and oil crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Breeding programmes of industrial crops, agricultural technologies, introduction of new crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>





Research needs from practice	Source
Research need from Focus Group: Validating the carbon captured by industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Life cycle assessment of industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Impact of industrial crops on biodiversity.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Phyto-management potential of industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Investigate the long-term environmental effects of plastic debris.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Improve the production processes of biodegradable plastics to make them more profitable.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Produce plastic materials that are more resistant, for mulch, greenhouse covers, irrigation pipes, nets, tunnels.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Generate new applications of plastic waste and develop better recycling processes.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Host-microbiome relationship.	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Nutrient management tools are lagging behind plant breeding in development and there is a need for more advanced, better updated nutrient management tools, which are able to incorporate the special needs of the new crop varieties to the planning process. These tools should be not only crop-based but variety-based, using the response curves for nutrient efficacy of these varieties.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Better control and quality checking on new input products, especially those that do not fall under strict regulations such as fertilisers. Especially products with plant growth promoting bacteria and other biological products.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Research on how plant analysis can be incorporated into nutrient management tools and decision making and how the results are comparable with soil analysis. This may also allow insight in yield quality of crops grown in different environments and under different soil, water, fertiliser and crop management.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Biodiversity: effects of measures like hedgerows, flower strips, cover crops,...; correlation between soil (biodiversity) and perennial crops; the effects of pesticides on natural enemies.	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Create better assessment methods for soil quality / health / properties in relation to nutrient management. Not only chemical and physical parameters of the soil should be measured, but also biological and morphological parameters. Also most of the nutrient management tools only use topsoil characteristics, while limiting layers may occur below the sampled, characterised layer. New tools, survey techniques and equipment should be developed to enable the inclusion of such limiting layers into the planning process.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
More advanced, result-driven nutrient management tools which can use soil sampling results post-harvest to evaluate the nutrient management programme and consider these for the next planning phase. Tools should also be multidimensional and should be able to use several data sources for the planning (laboratory data, remote sensing, climate etc.), which would also require improved modelling to calibrate satellite images, to better assist nutrient management.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>



Research needs from practice	Source
Development of decision support tools using digital technologies which take available water content and subsurface compactions into consideration during the planning of nutrient applications and irrigation. Often the predicted yield cannot be attained because precipitation is lower than average (expected), but farmers continue fertilising according to the fertilisation plan, due to the lack of this information in most of the tools. Tools should better incorporate available weather information and forecasts into the decision advice process.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Measuring emissions. Several models are available to predict emissions, e.g. modelling nitrate leaching to ground water, but these models are often too general and do not predict emissions properly EU-wide.  The estimates are sometimes valid for one area (mainly where the tool was developed), but research data linked with farmer data are needed to validate these model predictions. Basic and practical research regionally can help understand and fine-tune these prediction models for better results. Farmers are mainly said to be responsible for N leaching, but they need advice or a tool tuned to the local conditions.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
More advanced tools for GHG emission measurements, prediction models. The way GHG emissions are measured in the farm or at field level is not reliable enough to summarise how much GHG a farm is producing. There is a need for more in depth data, to create better models and calculations. Also there is a need for the harmonisation of methods, protocols and models, to deliver comparable results. When these are done, CO2 tags and later price tags can be added to the farming technology/emission level.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Revisiting the N-requirements in the legislation. With new varieties, new types of fertiliser, better efficiency in nutrient management, modern farming technology, higher yields, the N requirements in the legislation may need to be revised. This may require (field) testing the environmental and economic effects of legislation.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
On-site monitoring of natural or managed eco-hydrological processes	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Water accounting methods applicable at nested scales in order to support NbS assessment and decision making.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Establish a common framework for qualification and assessment of NbS that are specific to agricultural water management.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Adapting cost-benefit, cost-effectiveness and market-based analyses, using multi-criteria techniques, to the specific case of agricultural water management solutions.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Proposing new models of water governance adapted to the NbS is the role of interdisciplinary research.	<a href="#">FG 46: 'NbS for water management under climate change'</a>



**Resource management: Biodiversity and genetic resources in agriculture and forestry**

Research needs from practice	Source
Research need from Focus Group: How to evaluate the services provided by traditional systems	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Intensify research into systemic values of keeping animals	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: How to relate traditional systems of Outermost Regions (OR) to sustainability/services provided to develop labels	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Robustness and animal efficiency	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Understanding synergies and trade-offs of ecosystem services and setting priorities for the provision of ecosystem services for different forests. (see above)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Research need from Focus Group: Relevant agroecological alternatives to monocultures	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Impact of grass-based beef production systems on climate, biodiversity and animal welfare	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Plant breeding and seedling production in the face of climate change. How to find proper seed sources for the future forests considering climate change, resilience and adaptability; how to make use of existing sources and find proper provenances; how to make the climate change predictions compatible with seed and plant production (producing today the plants for the forests of the future).	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Research need from Focus Group: Implementing IPM in different contexts	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Solving the major pest and disease problems in the different climatic zones	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Genetics of pasture-based/low-input meat quality traits	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Adapted/optimum breeds for a pasture-based diet	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Influence of variation of farm management on rare species and habitat types	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Database on advised management measures on High Nature Value (HNV) pasture	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Mitigation of damages and compensation mechanisms for damage produced by wildlife on farms	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Tools for data collection and data analysis to assess, monitor and control damages produced by wildlife on farms	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Development of land-based tools to improve land management and avoid conflicts between wildlife and farming	<a href="#">FG 39: 'Wildlife and agricultural production'</a>



Research needs from practice	Source
Development of innovative communication and mediation tools to facilitate dialogue between farmers and other wildlife-related stakeholders in view of improving existing farming-wildlife governance models	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Research need from Focus Group: Better agronomic knowledge on the cultivation of aromatic crops and oil crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Breeding programmes of industrial crops, agricultural technologies, introduction of new crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Flora of contaminated sites that can be used as a genetic pool for breeding of industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Impact of industrial crops on biodiversity	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Scaling up of biobased industry	<a href="#">FG 40: 'Sustainable industrial crops'</a>
System approach: comprehensive indicators to describe technical, environmental, economic, and social performances; studies on plant-plant or species-species interactions; transition phase from 'conventional' orchards to agroecological production systems	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Biocontrol agents: potential side effects of released beneficials; adjuvants that increase the effectiveness of bio-insecticides, natural products that boost plant defence mechanisms	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Genetics: interaction between scion and rootstock and its effect on fruit tree health; important factors for growers to plant resistant cultivars; deployment of resistant cultivars in a systemic approach	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Precision Agriculture: robotics (technical and social aspects); remote trap monitoring in combination with decision support system; more prospective soil sensing to determine the soil microbiome	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Research need related to production: Technical research focusing on the evaluation of local varieties and breeds, solutions for weed and pest management, and climate change adaptations	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Biodiversity: effects of measures like hedgerows, flower strips, cover crops,...; correlation between soil (biodiversity) and perennial crops; the effects of pesticides on natural enemies	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>

### Resource management: Protein crops for sustainable agriculture

Research needs from practice	Source
Research need from Focus Group: Optimum sward management (grazing/cutting) for different species mixes	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Attaining balanced diets for cattle in harsher and arid climates	<a href="#">FG 42: 'Sustainable beef production systems'</a>



Resource management: Multi-functional forests for future generations	
Research needs from practice	Source
Understanding synergies and trade-offs of ecosystem services and setting priorities for provision of ecosystem services for different forests. (see above)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Plant breeding and seedling production in the face of climate change. (see above)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Diversity of biomass versus tailored solutions. There are many options for biomass value chains across Europe, depending on biomass availability, conversion technologies and markets, therefore tailored solutions need to be developed. To build biomass supply chains, solutions for sustainable biomass logistics are needed with technological innovations and skilled people.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
For farmers to invest in relatively new business of biomass use for producing biofuels and biochemicals, they need technical and non-technical know-how, and concerns about soil depletion due to residues collection and funding must be met. The main challenges include logistics, organisation and management at the different steps in the biomass supply chain.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Need for new technologies for harvesting and innovative side products in forestry. In some EU countries technological barriers limit the use of forestry biomass, of side-products and of co-products. The use of woody biomass for the biobased economy suffers from competition with cheaper, non-renewable alternatives and with cheaper imported woody biomass; resulting in some cases in Europe, in non-collection of forestry.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Structures and models supporting innovation in the longer term.  It takes more time for innovations to establish themselves than the usual duration of 'projects', especially when referring to social aspects. Therefore, longer-term support and commitment will ensure that innovations are taken up in practice, e.g. supporting peer learning, networking activities or giving continuity to knowledge platforms. The support could come from official institutions at different scales (from European Commission to ministries or municipalities) or could also rely on relevant organisations or networks.	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Models and strategies to support replication and transferability of forest innovation while considering the local and regional frameworks.  Uptake of innovations is likely to occur when they are well adapted to the local circumstances and actors, which means that innovations cannot be directly transferred from one place to another. In other words, to succeed in scaling up or replicating, innovation should reply to needs and motivations on the ground, so the starting point should always be the local community with the forest owners and all other relevant local actors.	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Building dialogue and common visions about the added value of forest systems and the need of management. Part of society has a negative perception of forest management (e.g. cutting trees), some land owners have the same perception of ecosystem services (which may mean more restrictions and regulations for them), etc. It is required to develop initiatives informing about the social and economic benefits of forests, trade-offs between ecosystem services, impact of unmanaged forests, importance of non-timber products. These could be initiatives targeting schools, young people, urban citizens, etc.	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Value chains for multifunctional forests. Several uses, purposes and harvests can coexist in the same forest and this complexity should work economically for each single forest owner. Some value chains have almost disappeared (e.g. resin) while new ones have to be created. And all have to be attractive, sustainable, disseminated to the public and also have demand. How to deal with all these value chains? Is it possible to have an integrated approach? How to create value chains for new products?	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>



Research needs from practice	Source
<p>Types of forest management and ways of involving new emerging types of forest owners (e.g. absent or from urban areas) in forest management.</p> <p>In order to reduce unmanaged forests and land abandonment, we need to design silviculture, forest management and business models in ways that are less demanding in terms of management, and that are suitable for absent owners. This can stimulate their collaboration and information, and raise awareness of what forests can provide. Specific attention should furthermore be paid to young and female owners and professionals who are usually neglected but who have different needs and opportunities and may have an important role for future forest management.</p>	<p><a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a></p>
<p>Suitable data and tools for monitoring and inventory in small-scale forest holdings.</p> <p>Current data available from Earth observation (such as Copernicus) and other remote sensing platforms is not precise enough for small-scale management or to apply for payment of ecosystem services in these holdings. Plus, many of the times forest managers are not skilled enough to use these data or tools. Up-to date and high-precision data are required, to know what happens in forests, and for payments for ecosystem services. This should be accessible to forest managers through ready-to-use platforms, tools, training and advice.</p>	<p><a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a></p>
<p>Setting up a real-time European forest monitoring system for forest pest and diseases, taking into consideration initiatives and work done with Copernicus, but also on a national and regional base.</p>	<p><a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a></p>
<p>Inventories combining remote sensing data and modelling wood quality.</p> <p>Currently, most of the forest inventories are only estimating volume of wood and, while in harvesting prices are mostly considering volume, timber trade works with volume and quality (most of the times, known after cutting). Combining forest inventory with modelling of wood quality would be of interest to most stakeholders across the EU, as this helps sellers to get a better price with a good independent assessment of the wood quality, and the industry can do better estimations of the supply.</p>	<p><a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a></p>
<p>Research need from Focus Group: Processing options and how the characteristics of biopolymers can be improved.</p>	<p><a href="#">FG 40: 'Sustainable industrial crops'</a></p>
<p>Research need from Focus Group: How biomass with different characteristics can be used in one processing plant.</p>	<p><a href="#">FG 40: 'Sustainable industrial crops'</a></p>
<p>Research need from Focus Group: Sustainable options to extract and recover added value compounds, and processing to high value products.</p>	<p><a href="#">FG 40: 'Sustainable industrial crops'</a></p>



Healthier plants and animals: Healthy plants in an ever-changing environment	
Research needs from practice	Source
Research need from Focus Group: Implementing IPM in different contexts	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: How biomass with different characteristics can be used in one processing plant.	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Sustainable options to extract and recover added value compounds, and processing to high value products.	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Better agronomic knowledge on the cultivation of aromatic crops and oil crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Breeding programmes of industrial crops, agricultural technologies, introduction of new crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Evaluation of existing research on industrial crops to find the gaps	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Increase land availability for industrial crops through intercropping/catch cropping	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Flora of contaminated sites that can be used as a genetic pool for breeding of industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Investigate the long-term environmental effects of plastic debris.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Biodiversity: effects of measures like hedgerows, flower strips, cover crops,...; correlation between soil (biodiversity) and perennial crops; the effects of pesticides on natural enemies.	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Research need related to production: Technical research focusing on the evaluation of local varieties and breeds, solutions for weed and pest management, and climate change adaptations.	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
System approach: comprehensive indicators to describe technical, environmental, economic, and social performances; studies on plant-plant or species-species interactions; transition phase from 'conventional' orchards to agroecological production systems.	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Biocontrol agents: potential side effects of released beneficials; adjuvants that increase the effectiveness of bio-insecticides, natural products that boost plant defence mechanisms.	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Genetics: interaction between scion and rootstock and its effect on fruit tree health; important factors for growers to plant resistant cultivars; deployment of resistant cultivars in a systemic approach.	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Nutrient management tools are lagging behind plant breeding in development and there is a need for more advanced, better updated nutrient management tools, which are able to incorporate the special needs of the new crop varieties to the planning process. These tools should not only be crop-based but variety-based, using the response curves for nutrient efficacy of these varieties.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>



Research needs from practice	Source
Better control and quality checking on new input products, especially those that do not fall under strict regulations such as fertilisers. Especially products with plant growth promoting bacteria and other biological products.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Research on how plant analysis can be incorporated into nutrient management tools and decision making and how the results are comparable with soil analysis. This may also allow insight in yield quality of crops grown in different environments and under different soil, water, fertiliser and crop management.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Social aspects: studies on social perception and consumer behaviour	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>

Healthier plants and animals: Healthy animals for healthy people	
Research needs from practice	Source
Research need from Focus Group: Attaining balanced diets for cattle in harsher and arid climates	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Robustness and animal efficiency	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Impact of grass-based beef production systems on climate, biodiversity and animal welfare	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Genetics of pasture-based/low-input meat quality traits	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Adapted/optimum breeds for a pasture-based diet	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Economics of finishing beef cattle on pasture-based systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Methane production variations between different breeds	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Efficiency and safety of different on-farm slaughtering techniques	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Development of novel technologies for pastoral systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: On-farm animal welfare assessment in grass-based systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Impact of grazing management on animal diseases	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Virtual fencing	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Attaining balanced diets for cattle in harsher and arid climates	<a href="#">FG 42: 'Sustainable beef production systems'</a>





Research needs from practice	Source
Research need from Focus Group: Investigate the long-term environmental effects of plastic debris.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Controlling antimicrobial resistance	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Host-microbiome relationship	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Chick development	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Water management in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Nutrition and feeding in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Data capture and sharing	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Precision livestock farming in poultry	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Vaccines against bacterial diseases	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: On-farm testing and monitoring tools in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Biosecurity in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>

### Integrated ecological approaches from farm to landscape level: Ecological approaches in land-based primary production

Research needs from practice	Source
Research need from Focus Group: Implementing IPM in different contexts	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Solving the major pest and disease problems in the different climatic zones	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Effect of manure and compost on soils and crops	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Intensify research into systemic values of keeping animals	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: How to relate traditional systems of Outermost Regions (OR) to sustainability/services provided to develop labels	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Relevant agroecological alternatives to monocultures	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>



Research needs from practice	Source
Research need from Focus Group: Level of eco-efficiency of traditional practices combining crops and livestock to limit inputs	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Interregional or local projects in ORs to identify ways to intensify traditional systems in a sustainable way	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: European cotton access to the market.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Biodiversity: effects of measures like hedgerows, flower strips, cover crops,...; correlation between soil (biodiversity) and perennial crops; effects of pesticides on natural enemies	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
System approach: comprehensive indicators to describe technical, environmental, economic, and social performances; studies on plant-plant or species-species interactions; transition phase from 'conventional' orchards to agroecological production systems	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Biocontrol agents: potential side effects of released beneficials; adjuvants that increase the effectiveness of bio-insecticides, natural products that boost plant defence mechanisms	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
On-site monitoring of natural or managed eco-hydrological processes	<a href="#">Focus Group NbS for water management under climate change</a>
Water accounting methods applicable at nested scales in order to support NbS assessment and decision-making.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Establish common framework for qualification and assessment of NbS that are specific to agricultural water management	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Adapting cost-benefit, cost-effectiveness and market-based analyses, using multi-criteria techniques, to the specific case of agricultural water management solutions	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Proposing new models of water governance adapted to the NbS is the role of interdisciplinary research.	<a href="#">FG 46: 'NbS for water management under climate change'</a>

### Integrated ecological approaches from farm to landscape level: Climate action in agriculture and forestry

Research needs from practice	Source
Research need from Focus Group: Intensify research into systemic values of keeping animals	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Relevant agroecological alternatives to monocultures	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Attaining balanced diets for cattle in harsher and arid climates	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Impact of grass-based beef production systems on climate, biodiversity and animal welfare	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Methane production variations between different breeds	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Plant breeding and seedling production in the face of climate change. (see above)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>



Research needs from practice	Source
Research need from Focus Group: How to evaluate the services provided by traditional systems.	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Involving farmers and foresters in the development of new processes and activities in the circular economy. (see above)	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Understanding nutrient content from waste streams for use as inputs to the primary sectors. This should include the technical and agronomic characteristics, economic and environmental viability.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Research need from Focus Group: The role of industrial crops in carbon farming schemes.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: End-of-life management of biobased material.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Incorporation of industrial crops into biocomposites.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Processing options and how the characteristics of bio-polymers can be improved.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: How biomass with different characteristics can be used in one processing plant.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Characteristics and quality of biomass grown on marginal and contaminated soils.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Innovation, research and development of harvesting and processing machinery.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Sustainable options to extract, recover, added value compounds and processing to high value products.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Validating the carbon captured by industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Life cycle assessment of industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Impact of industrial crops on biodiversity.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Phyto-management potential of industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Produce plastic materials that are more resistant, for mulch, greenhouse covers, irrigation pipes, nets, tunnels.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Design-for-recycling approach in plastic production to facilitate recycling.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
On-site monitoring of natural or managed eco-hydrological processes .	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Water accounting methods applicable at nested scales in order to support NbS assessment and decision-making.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Establish common framework for qualification and assessment of NbS that are specific to agricultural water management.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Adapting cost-benefit, cost-effectiveness and market-based analyses, using multi-criteria techniques, to the specific case of agricultural water management solutions.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Proposing new models of water governance adapted to the NbS is the role of interdisciplinary research.	<a href="#">FG 46: 'NbS for water management under climate change'</a>



Research needs from practice	Source
Proposing new models of water governance adapted to the NbS is the role of interdisciplinary research.	<a href="#">FG 46: 'NbS for water management under climate change'</a>
Research need related to production: Technical research focusing on the evaluation of local varieties and breeds, solutions for weed and pest management, and climate change adaptations.	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Measuring emissions. Several models are available to predict emissions, e.g. modelling nitrate leaching to ground water, but these models are often too general and do not predict emissions properly EU-wide. The estimates are sometimes valid for one area (mainly where the tool was developed), but research data linked with farmer data are needed to validate these model predictions. Basic and practical research regionally can help understand and fine-tune these prediction models for better results. Farmers are mainly said to be responsible for N leaching, but they need advice or a tool tuned to the local conditions.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
More advanced tools for GHG emission measurements, prediction models. The way GHG emissions are measured in the farm or field level, is not reliable enough to summarise how much GHG a farm is producing, there is a need for more in depth data, to create better models and calculations. There is also a need for the harmonisation of methods, protocols and models, to deliver comparable results. When these are done CO2 tags and later price tags can be added to the farming technology/emission level.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Research need related to processing: Sustainable packaging material, the use of organic by-products from processing, and reducing energy consumption for processing.	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>

Integrated ecological approaches from farm to landscape level: Sustainable livestock systems	
Research needs from practice	Source
Research need from Focus Group: Intensify research into systemic values of keeping animals.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Attaining balanced diets for cattle in harsher and arid climates.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Impact of grass-based beef production systems on climate, biodiversity and animal welfare.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Methane production variations between different breeds.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Methods to differentiate the meat quality in pasture-based systems and others.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Level of eco-efficiency of traditional practices combining crops and livestock to limit inputs.	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Research need from Focus Group: Robustness and animal efficiency.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Genetics of pasture-based/low-input meat quality traits.	<a href="#">FG 42: 'Sustainable beef production systems'</a>



Research needs from practice	Source
Research need from Focus Group: Adapted/optimum breeds for a pasture-based diet	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Economics of finishing beef cattle on pasture-based systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Efficiency and safety of different on-farm slaughtering techniques	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Development of novel technologies for pastoral systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: On-farm animal welfare assessment in grass-based systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Impact of grazing management on animal diseases	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Virtual fencing	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Optimum sward management (grazing/cutting) for different species mixes	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Decision Support Systems on quantification and estimation of grass availability in quantity and quality	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Influence of variation of farm management on rare species and habitat types	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Database on advised management measures on HNV pasture	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Controlling antimicrobial resistance	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Host-microbiome relationship	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Chick development	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Water management in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Nutrition and feeding in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Data capture and sharing	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Precision livestock farming in poultry	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Vaccines against bacterial diseases	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: On-farm testing and monitoring tools in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Biosecurity in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>



### 3.2 Research needs related to enhancing rural innovation – modernising rural territories and policies

Below in Table 4, all research needs that are relevant to enhancing rural innovation and modernising rural territories and policies have been grouped according to the two corresponding strategic priority areas 'new openings for rural growth' and 'enhancing the human and social capital in rural areas'. For each of these strategic priorities, Table 4 presents the research needs per related research priority. As above, most research needs are relevant to more than one research priority, so they may appear several times, and in different sections of the table. For each research need from practice, the source is again mentioned with a hyperlink to the corresponding webpage.



**Table 4. Research needs related to enhancing rural innovation – modernising rural territories and policies**

Integrated ecological approaches from farm to landscape level: Small-scale, sustainable biobased systems	
Research needs from practice	Source
Involving farmers and foresters in the development of new processes and activities in the circular economy. (see above)	<a href="#">EIP-AGRI Workshop 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Diversity of biomass versus tailored solutions. (see above)	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
For farmers to invest in the relatively new business of biomass use for producing biofuels and biochemicals, they need know-how, and concerns about soil depletion due to residues collection and funding must be met. Main challenges include logistics, organisation and management at the different steps in the biomass supply chain.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Need for new technologies for harvesting and innovative side products in forestry. (see above)	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Developing new processes in grass biorefinery. Biorefinery is a first step towards moving farmers further up the bioeconomy value chain and becoming producers of semi-finished/ finished products rather than suppliers of biomass. Producing and validating multiple products from grass through biorefining, including an improved fodder press-cake fibre for cattle, protein concentrate feed for monogastric, high value prebiotic sugars and recovery of nutrients for use as fertiliser can be extended by developing new processes to the production of building materials, gas, medicine, cosmetics, clothes, glue or food.	<a href="#">EIP-AGRI Workshop 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Research need from Focus Group: The role of industrial crops in carbon farming schemes	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Regulatory barriers to the uptake of industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Sustainable standards for cultivation and manufacturing of industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>



Research needs from practice	Source
Research need from Focus Group: European cotton access to the market	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: End-of-life management of biobased material	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Bringing research on drying methods of biomass to farmers	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Developing Biomass Trade Centres to mobilise the sector efficiently and in cooperation	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Incorporation of industrial crops into biocomposites	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Processing options and how the characteristics of biopolymers can be improved	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: How biomass with different characteristics can be used in one processing plant	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Characteristics and quality of biomass grown on marginal and contaminated soils	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Innovation, research and development of harvesting and processing machinery	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Sustainable options to extract, recover, added value compounds and processing to high value products	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Evaluation of existing research on industrial crops to find the gaps	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Increase land availability for industrial crops through intercropping/catch cropping	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Measuring and improving profits of industrial crops on marginal land	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Validating the carbon captured by industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Life cycle assessment of industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Phyto-management potential of industrial crops	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Scaling up of biobased industry	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Demonstration models and research development of entire crop utilisation for numerous markets	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: An improved network for farmers, processors, advisors and research bodies	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Improve the production processes of biodegradable plastics to make them more profitable.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>



Research needs from practice	Source
Research need from Focus Group: Generate new applications of plastic waste and develop better recycling processes	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Design-for-recycling approach in plastic production to facilitate recycling	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need related to production: Benefits of organic farming for society, resilience research feasibility of biodistricts, cooperative business models	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Research need related to marketing: communication strategies and true cost accounting	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>

Integrated ecological approaches from farm to landscape level: Enabling digital and data technologies	
Research needs from practice	Source
Research need from Focus Group: Development of novel technologies for pastoral systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: On-farm animal welfare assessment in grass-based systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Virtual fencing	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Database on advised management measures on HNV pasture	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Decision Support Systems on quantification and estimation of grass availability in quantity and quality	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Suitable data and tools for monitoring and inventory in small-scale forest holdings. (see above for further details)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Setting up a real-time European forest monitoring system for forest pests and diseases, taking into consideration initiatives and work done with Copernicus, but also on a national and regional base.	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Inventories combining remote sensing data and modelling wood quality. (see above for further details)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Tools for data collection and data analysis to assess, monitor and control damages produced by wildlife on farms	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Research need from Focus Group: Tools to efficiently share knowledge among farmers and other actors	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Integrated data for better and more complex decision making. There is an urgent need to integrate data from different sources and to scale up to create harmonised, easily accessible and qualitative data sets. These sets are needed to take the step to interoperable digital solutions that support complex data-driven decision making. This is linked to the concept of a data space and to the proposed partnership 'Agriculture of Data'.	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>





Research needs from practice	Source
<p>Simplified, visualised and demonstrated data solutions for better use by farmers. A better understanding by farmers of the data and its value is needed. To address this need, it should be further explored how data can be simplified, visualised, can be more easily accessible, better explained and applicable at farm level. To achieve a better involvement of farmers, it is recommended to start from a real farming problem and to use data to solve this problem. This means that more domain experts and IT experts should come together, speak the same language and understand each other. Specialised advisors could become data interpreters and demonstrate the value and the benefits of data (short, as well as medium and long-term benefits). Besides the benefits, the costs should be made clear and be demonstrated. The transaction costs, i.e. the time farmers and advisors invest to find optimal solutions, should not be underestimated. Data intermediaries and platforms need a thorough understanding of the needs of farmers and the farm ecosystem.</p>	<p><a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a></p>
<p>Two-way data flows to improve the value for all data should not stay on the farm. It needs to go up the supply chain to create value. Farm data can help suppliers to show the sustainability of their production systems in a traceable way. The consumer values this information and appreciates transparency. However, it is of key importance to also bring data from outside the farm back into the farm. Data from slaughterhouses, processors, suppliers, retail and even from the consumer needs to flow back to the farmer. Even further, citizens could also deliver valuable data to farmers, e.g. when monitoring the water content with sensors in their gardens.</p>	<p><a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a></p>
<p>Integration of farmers' knowledge for improved digital services.</p> <p>To improve the algorithms for decision making and to answer to new and upcoming needs of the farmers, it is crucial to consider farmers' practical knowledge and experience. Data and digital technologies should be used to conduct on-farm experimentation, to involve farmers in improving the algorithms and develop solutions on real farms, instead of via experimental farms. To involve farmers in this way, farmer education plays a crucial role. There is still a knowledge and capacity gap in secondary schools that needs to be addressed. Study programmes need to be updated and teachers engaged to focus more on digital knowledge. By learning digital skills at school, students will be able to support digitalisation at home on the farm.</p>	<p><a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a></p>
<p>Exploring the cooperative model for trusted data sharing.</p> <p>Creating qualitative combined farm data sets should start at the level of the individual farmers. Therefore, cooperative models and related business models for sharing and valorising data need to be further explored, also taking into account the needs of small and medium-sized farmers. Cooperation can unlock the power that farmers have to generate valuable information for stakeholders, based on large integrated farm data sets. Farm Data cooperatives, either built on existing cooperatives or newly created, have many advantages like cost-effectiveness and easier access to many data providers and data users. Moreover, they can take into account the regional perspective and associated needs. They can also be the basis for more cooperation with researchers and provide extra support for education, advice, testing and investments. Cooperative data sharing intermediaries can take care of those tasks related to data exchange and valorisation that farmers cannot tend to due to their daily job. But most importantly, data cooperatives can help build trust.</p> <p>They can act as data custodians, and ensure that farmers stay in control of their data, as agreed in the Code of Conduct on Agricultural Data Sharing by contractual agreement, and tend to data security issues.</p>	<p><a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a></p>



Research needs from practice	Source
Research need from Focus Group: Chick development	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Precision livestock farming in poultry	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: On-farm testing and monitoring tools in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Create better assessment methods for soil quality / health / properties in relation to nutrient management. Not only chemical and physical parameters of the soil should be measured, but also biological and morphological parameters. Also, most of the nutrient management tools only use topsoil characteristics, while limiting layers may occur below the sampled, characterised layer. New tools, survey techniques and equipment should be developed to enable the inclusion of such limiting layers into the planning process.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
More advanced, result-driven NM tools which can use soil sampling results post-harvest to evaluate the nutrient management programme and consider these for the next planning phase. Tools should also be multidimensional and should be able to use several data sources for the planning (laboratory data, remote sensing, climate etc.), which would also require improved modelling to calibrate satellite images to better assist nutrient management.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Development of decision support tools using digital technologies which takes available water content and subsurface compactions into consideration during the planning of nutrient applications and irrigation.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Often the predicted yield cannot be attained because precipitation is lower than average (expected), but farmers continue fertilising according to the fertilisation plan, due to the lack of this information in most of the tools. Tools should better incorporate available weather information and forecasts into the decision advice process.	
Measuring emissions. Several models are available to predict emissions, e.g. modelling nitrate leaching to ground water, but these models are often too general and do not predict emissions properly EU-wide. The estimates are sometimes valid for one area (mainly where the tool was developed), but research data linked with farmer data are needed to validate these model predictions. Basic and practical research regionally can help understand and fine-tune these prediction models for better results. Farmers are mainly said to be responsible for N leaching, but they need advice or a tool tuned to the local conditions.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
More advanced tools for GHG emission measurements, prediction models. The way GHG emissions are measured in the farm or field level, is not reliable enough to summarise how much GHG a farm is producing, there is a need for more in-depth data, to create better models and calculations. Also, there is a need for the harmonisation of methods, protocols and models, to deliver comparable results. When these are done, CO2 tags and later price tags can be added to the farming technology/emission level.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Research on how plant analysis can be incorporated into nutrient management tools and decision making and how the results are comparable with soil analysis. This may also allow insight in yield quality of crops grown in different environments and under different soil, water, fertiliser and crop management.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Precision Agriculture: robotics (technical and social aspects); remote trap monitoring in combination with decision support system; more prospective soil sensing to determine the soil microbiome	



### Enhancing the human and social capital in rural areas: Agricultural Knowledge and Innovation Systems (AKIS) of the future

Research needs from practice	Source
Research need from Focus Group: Database on advised management measures on HNV pasture	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Tools to efficiently share knowledge among farmers and other actors	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Simplified, visualised and demonstrated data solutions for better use by farmers (also see above)	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Integration of farmers' knowledge for improved digital services (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Exploring the cooperative model for trusted data sharing (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Research need from Focus Group: Interregional or local projects in Outermost Regions (OR) to identify ways to intensify traditional systems in a sustainable way	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Structures and models supporting innovation in the longer term. (see above for further details)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Models and strategies to support replication and transferability of forest innovation while considering the local and regional frameworks. (see above for further details)	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Governance models for forest innovation. How can innovation processes be best supported in forestry? Existing institutional structures in forestry have supportive and hindering effects for innovation in a circular bioeconomy. There are several weaknesses in the existing forestry innovation systems, including weak orientation for new goods and services and barriers to cross-sectoral collaboration. Good practice examples include structures that connect to local resources and initiatives, support cross-sectoral collaboration, include users and foster social innovation. Better knowledge of innovation processes in successful innovation support examples on regional, national or European level is needed in order to promote and learn from those examples and derive factors and principles for amplification of forest innovations.	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Research need from Focus Group: Innovation, research and development of harvesting and processing machinery	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: An improved network for farmers, processors, advisors and research bodies.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Nutrition and feeding in poultry farming	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>
Research need from Focus Group: Data capture and sharing	<a href="#">FG 38: 'Reducing antimicrobial use in poultry farming'</a>



**Enhancing the human and social capital in rural areas:**  
Innovative policies, business models and value chains enabling sustainable food systems

Research needs from practice	Source
Exploring the cooperative model for trusted data sharing. Creating qualitative, combined farm data sets should start at the level of the individual farmers. Therefore, cooperative models and related business models for sharing and valorising data need to be further explored, also taking into account the needs of small and medium-sized farmers. (also see above)	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Research need from Focus Group: Development of novel technologies for pastoral systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Two-way data flows to improve the value for all (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Involving farmers and foresters in the development of new processes and activities in the circular economy. (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Diversity of biomass versus tailored solutions. (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Need for new technologies for harvesting and innovative side products in forestry. (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Developing new processes in grass biorefinery. (see above for further details)	<a href="#">EIP-AGRI Workshop: 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Research need from Focus Group: Methods to differentiate the meat quality in pasture-based systems and others	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Economics of finishing beef cattle on pasture-based systems	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Efficiency and safety of different on-farm slaughtering techniques	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: How to evaluate the services provided by traditional systems	<a href="#">FG 43: 'Climate-smart (sub)tropical food crops in the EU'</a>
Understanding nutrient content from waste streams for use as inputs to the primary sectors. This should include the technical and agronomic characteristics, economic and environmental viability.	<a href="#">EIP-AGRI Workshop: 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Mitigation of damages and compensation mechanisms for damage produced by wildlife on farms	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Development of land-based tools to improve land management and avoid conflicts between wildlife and farming	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Development of innovative communication and mediation tools to facilitate dialogue between farmers and other wildlife-related stakeholders in view of improving existing farming-wildlife governance models	<a href="#">FG 39: 'Wildlife and agricultural production'</a>



Research needs from practice	Source
Research need from Focus Group: Market research and willingness-to-pay	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Development of novel products for consumer groups with specific needs	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: European cotton access to the market.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Measuring and improving profits of industrial crops on marginal land.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Demonstration models and research development of entire crop utilisation for numerous markets.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Improve the production processes of biodegradable plastics to make them more profitable	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Generate new applications of plastic waste and develop better recycling processes.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need from Focus Group: Design-for-recycling approach in plastic production to facilitate recycling.	<a href="#">FG 41: 'Reducing the plastic footprint of agriculture'</a>
Research need related to production: Benefits of organic farming for society, resilience research feasibility of biodistricts, cooperative business models	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Research need related to marketing: communication strategies and true cost accounting	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Research need related to processing: Sustainable packaging material, the use of organic by-products from processing, and reducing energy consumption for processing.	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Better control and quality checking on new input products, especially those that do not fall under strict regulations such as fertilisers. Especially products with plant growth promoting bacteria and other biological products.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Social aspects: studies on social perception and consumer behaviour	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Revisiting the N-requirements in the legislation. With new varieties, new types of fertiliser, better efficiency in nutrient management, modern farming technology, higher yields, the N requirements in the legislation may need to be revised. This may require (field) testing the environmental and economic effects of legislation.	<a href="#">FG 45: 'Digital tools for sustainable nutrient management'</a>
Research need related to production: Socio-economic research including for instance the identification and development of appropriate communication strategies	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Research need related to distribution: success factors for cooperation, market surveys e.g. for price levels, traceability in short supply chains	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>



**Enhancing the human and social capital in rural areas:** Rural and social dynamics: towards smart, green and inclusive rurality

Research needs from practice	Source
Simplified, visualised and demonstrated data solutions for better use by farmers.	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Exploring the cooperative model for trusted data sharing (see above for further details).	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
Involving farmers and foresters in the development of new processes and activities in the circular economy. (see above for further details).	<a href="#">EIP-AGRI Workshop: 'Opportunities for Agriculture and Forestry in the Circular Economy'</a>
Diversity of biomass versus tailored solutions. (see above for further details).	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Development of land-based tools to improve land management and avoid conflicts between wildlife and farming.	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Development of innovative communication and mediation tools to facilitate dialogue between farmers and other wildlife-related stakeholders in view of improving existing farming-wildlife governance models.	<a href="#">FG 39: 'Wildlife and agricultural production'</a>
Research need from Focus Group: Market research and willingness-to-pay.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Research need from Focus Group: Development of novel products for consumer groups with specific needs.	<a href="#">FG 42: 'Sustainable beef production systems'</a>
Integrated data for better and more complex decision making. This is linked to the concept of a data space and the proposed partnership 'Agriculture of Data'. (see above for further details).	<a href="#">EIP-AGRI Workshop: 'Farm data for better farm performance'</a>
For farmers to invest in relatively new business of biomass use for producing biofuels and biochemicals, they need know-how, and concerns about soil depletion due to residues collection and funding must be met. Main challenges include logistics, organisation and management at the different steps in the biomass supply chain.	<a href="#">EIP-AGRI Workshop: 'Building new biomass supply chains for the bio-based economy'</a>
Building dialogue and common visions about the added value of forest systems and the need of management. (see above for further details).	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Types of forest management and ways of involving new emerging types of forest owners (e.g. absent or from urban areas) in forest management. (see above for further details).	<a href="#">EIP-AGRI Seminar: 'Turning forest innovation into practice'</a>
Research need from Focus Group: The role of industrial crops in carbon farming schemes.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Sustainable standards for cultivation and manufacturing of industrial crops.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Bringing research on drying methods of biomass to farmers.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Developing Biomass Trade Centres to mobilise the sector efficiently and in cooperation.	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Measuring and improving profits of industrial crops on marginal land.	<a href="#">FG 40: 'Sustainable industrial crops'</a>



Research needs from practice	Source
Research need from Focus Group: Scaling up of biobased industry	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: Demonstration models and research development of entire crop utilisation for numerous markets	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need from Focus Group: An improved network for farmers, processors, advisors and research bodies	<a href="#">FG 40: 'Sustainable industrial crops'</a>
Research need related to production: Benefits of organic farming for society, resilience research feasibility of biodistricts, cooperative business models	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Research need related to marketing: communication strategies and true cost accounting	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Social aspects: studies on social perception and consumer behaviour	<a href="#">FG 44: 'Sustainable ways to reduce pesticides in pome and stone fruit production'</a>
Research need related to production: Socio-economic research including for instance the identification and development of appropriate communication strategies	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>
Research need related to distribution: success factors for cooperation, market surveys e.g. for price levels, traceability in short supply chains	<a href="#">EIP-AGRI Workshop: 'Conversion to organic farming'</a>



## 4. Analysis per CAP objective

Based on a preliminary assessment by the Support Facility for Innovation and Knowledge exchange | EIP-AGRI, most of the included research needs from practice address more than one of the nine specific CAP objectives, or the CAP's cross-cutting objectives. Following an internal assessment, all research needs from practice were allocated to the three most relevant CAP objectives. These allocations

were numbered from 1 to 3 in order of relevance, with 1 indicating the most relevant CAP objective for the respective research need.

Table 5 below shows the division of all 122 research needs from practice, linked to their **most relevant CAP objective** (i.e. the objective marked as 'number 1').

**Table 5. Division of research needs from practice by CAP objectives**

CAP Objective	Number of research needs from practice linked to their most relevant CAP objective
CCO - Building up a well-functioning AKIS, including digitalisation	2
CCO - Modernising the sector by fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake	14
S01 - Support viable farm income and resilience across the EU territory to enhance food security	5
S02 - Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation	15
S03 - Improve farmers' position in the value chain	1
S04 - Contribute to climate change mitigation and adaptation, as well as sustainable energy	11
S05 - Foster sustainable development and efficient management of natural resources such as water, soil and air	17
S06 - Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes	14
S07 - Attract young farmers and facilitate business development in rural areas	1
S08 - Promote employment, growth, social inclusion and local development in rural areas, including bioeconomy and sustainable forestry	25
S09 - Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, food waste, as well as animal welfare	17
<b>Total</b>	<b>122</b>

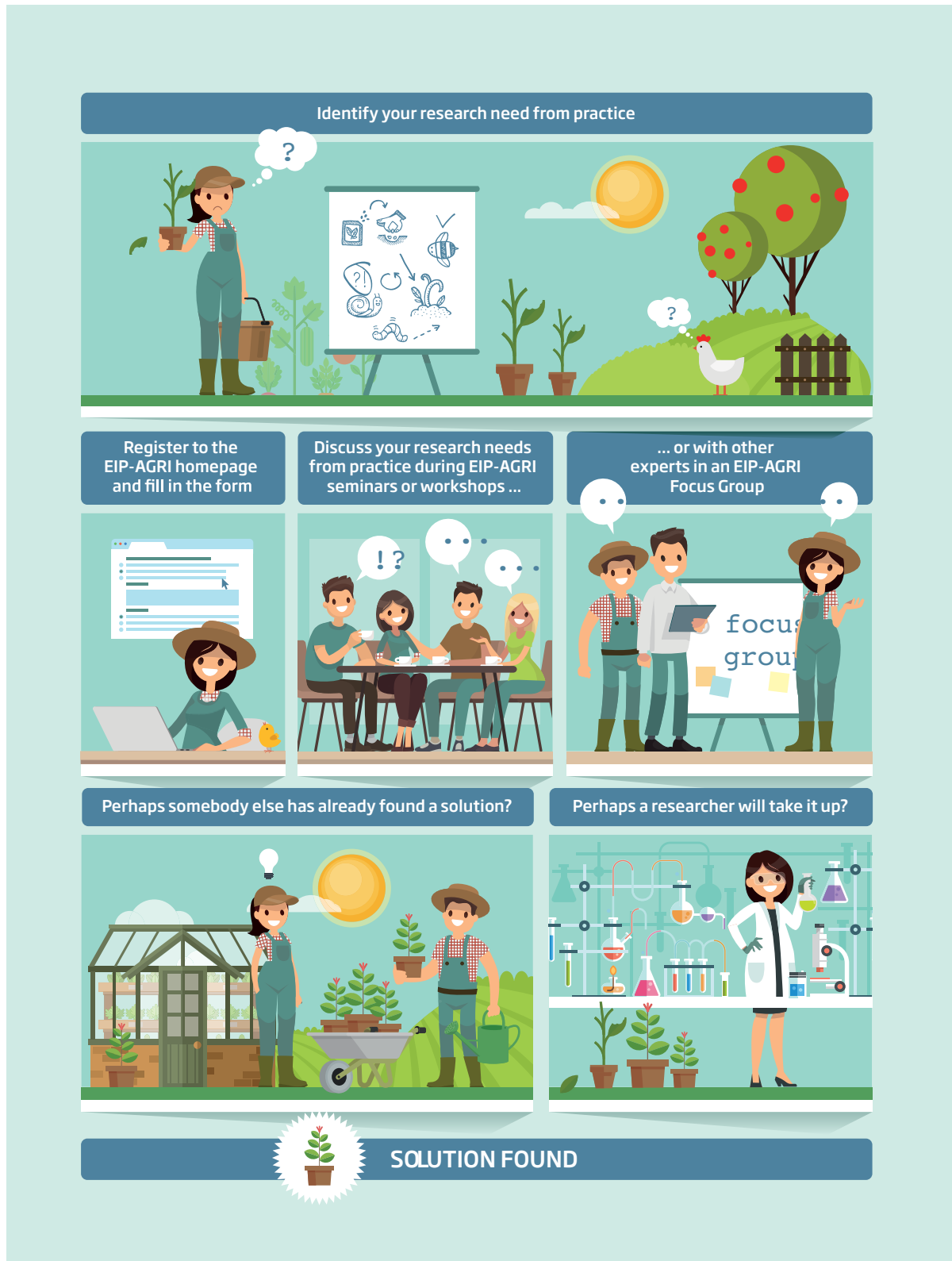
The table above shows that some CAP objectives are addressed more than others. This is because this exercise has only started rather recently and it is too early to draw firm conclusions. In addition, a number of research needs depend highly on the specific topics of Focus Groups and other events and the CAP priorities they are addressing. In the long run, this distribution might become more balanced.





## 5. Browsing the research needs online

All research needs from practice are still available [on the EIP-AGRI website](#). These and future research needs will be published and made searchable [on the EU CAP Network website](#).



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