REPORT

SCAR CONFERENCE "Humans in transitions: towards agroecological approaches and sustainable food systems" 14 June 2022

SCAR
Standing Committee
on Agricultural Research

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SCAR Conference, Paris (France) – 14 June 2022

SCAR SUPPORT TEAM | July 2022

Introduction

The SCAR Conference was hosted and organised with the support of the French Presidency of the EU, in Paris, on 14 June 2022. It was built as an interactive SCAR-level event, structured around 4 parallel thematic workshops.

Paths for transitions are multiple and research has a major role to play in finding those. The way the SCAR Working Groups are addressing transitions is evolving from a silo-based to a more cross-cutting approach in which issues are tackled with a more holistic approach, allowing for closer cross-fertilisation among the various groups. The overarching goal of the conference was to engage and further motivate the SCAR Working Groups to tackle cross-cutting issues related to transitions.

The conference aimed to foster discussion between SCAR members regarding:

- Necessary changes that the agri-food sector needs to undergo in the current crisis context (COVID, climate change, war…) but also opportunities (e.g. animal well-being, promoting more resilient farming and food systems);
- How to manage the transitions (agroecosystems, food systems, knowledge systems…) simultaneously and put the human being at the centre.

Its specific objectives were:

- Sharing experiences to demonstrate that tools proposed to farmers and other stakeholders can help to prepare the necessary changes if the tools are appropriated;
- Building up on the paths for transitions identified in the 5th SCAR Foresight, identify key contributions from agricultural research.
- Defining focus points for R&I within different SCAR groups, steer their upcoming mandates

The expected outcomes from this conference were the following:

- General agreement of the SCAR members on the research topics that can support the transitions;
- Identification of pragmatic and concrete actions for the SCAR to undertake (e.g., set up a task force, a working group, write a position paper, etc.).

Jean-Marc Chourot, from the French Ministry of Agriculture and Food Sovereignty, introduced the conference's programme to the participants. This conference was the first live conference after the one in Belgium before the COVID crisis. That crisis made all participants realise that the human factor is really important in transition, which is the main focus of the conference.

He gave the floor to **Valérie Baduel**, General Directorate of Education and Research (French Ministry of Agriculture and Food Sovereignty) and **Anne Puech**, General Directorate for Research and Innovation (French Ministry of Higher Education, Research and Innovation) to introduce the conference.

Session 1: Setting up the scene

Welcoming words

Valérie Baduel started by saying that she was honoured to host this conference in the frame of the French Presidency of the EU and happy to host this event lively. She welcomed the involvement of the SCAR and the European Research Area during this difficult period of virtual meetings.

Since the last SCAR Conference, several acute crises occurred: COVID, animal pests and diseases, etc.
We need to transform our Food Systems (FS) towards more resilience and sustainability.
The 5th SCAR Foresight study gave already some elements and the European Green Deal (EGD) fixed some ambitious targets to tackle this challenge.

Research and Innovation (R&I) are cornerstones of those transitions and the SCAR reflections were very useful to identify new R&I topics. In addition, some SCAR Working Groups (WGs) are at the core of those new EU Horizon partnerships. These will be assets in their co-creation process.

Examples of R&I inputs to consider: support the development of technologies like biocontrol or biostimulants, develop robotics to reduce the use of pesticides and lighten the workload, create new decision-making tools, and deal with the emergence of diseases, and with the effects of climate change. Genetics can provide resistant varieties to drought and diversity from farm to fork.

Technologies must support farmers. The human factor is at the centre of agricultural and food systems and should be the basis for their sustainability.
Technologies must be interconnected with social innovations. These convictions have served the set-up of today's agenda: humans are in the centre and how research can provide them with tools. How to consider human expectations about these elements? Furthermore, it is essential to identify the skills and training needed for future systems, which is the focus of one of the interactive workshops.

She finally thanked all participants, the SCAR Support Team and the Task Force engaged in the organisation of this event and wished everyone a fruitful meeting that hopefully will shape the future SCAR agenda and accelerate transitions through public policy.

Anne Puech excused Claire Giry, General Directorate for Research and Innovation (French Ministry of Higher Education, Research and Innovation), who could not attend the conference.
Looking at intensive farming practices, she considered of high importance the deep and necessary transformation of farming and food systems.
Agroecology puts ecology at the heart of agricultural systems and will help find solutions to global challenges. Our systems should at the same time respond to society's requests and be sustainable and viable for farmers.
The Programme "France 2030" is an ambitious 7-year-long programme that will support R&I in that area.
Some themes of this programme echo today's workshops:

- Research work in Genetic resources and genomics
- Work on the microbiome and fermenting agent,
- Link between soil and animal health, and food.
- Digital: collection of data, robotics to lighten the farmers' workload,
- Progress in biocontrol to limit pesticides with stress-resistant plants…

In addition to those, this programme will enhance upscaling agroecological practices and low-tech approaches, to support practitioners who want to develop more sustainable farming and food systems.

The Living Labs (LL) concept will help to mobilise organisational and digital innovations.
She then announced that for each of the foreseen Cluster 06 Horizon Europe partnerships, financial commitments of the French Ministries amount to 14 million EUR in cash plus 50-100 million EUR in kind over 7 years.
Biodiversa+, Water4All and Blue Economy partnerships are also supported by the French Ministries.
These commitments will require overcoming some contractual difficulties, in particular in relation which the participation of research institutes in the partnerships.

She ended her speech by thanking her colleagues from the French Ministry of Agriculture and Food Sovereignty and all European participants at the conference. She hoped this day to be very constructive and rich in new proposals.

Jean-Marc Chourot gave then the floor to Tom Arnold.

Why do we need Science-Policy Interfaces for food systems' transitions? – Tom Arnold

Tom Arnold is the chair of the European Commission High-Level Expert Group.

The facts are that there are longer-term drivers of change, at the international level through different **tools** either at the international level: Sustainable Development Goals, Paris Climate Agreement that led to the UN Food Systems Summit (UNFSS) or the EU level: European Green Deal, CAP reform, and the Food 2030 policy.

The concept of Food Systems (FS) over the last decades was considered but the COVID crisis and now the Ukrainian war acted as accelerators of change.

Very thoughtful feedback from SCAR was coming from the 5th SCAR Foresight report: where 3 transition pathways were identified, linked to resilience, diets/nutrition and circular economy.

The Ukraine crisis will have short and long-term implications. The humanitarian crisis is affecting thousands of people over the world. The African and Middle East countries are very dependent on Ukrainian exports.

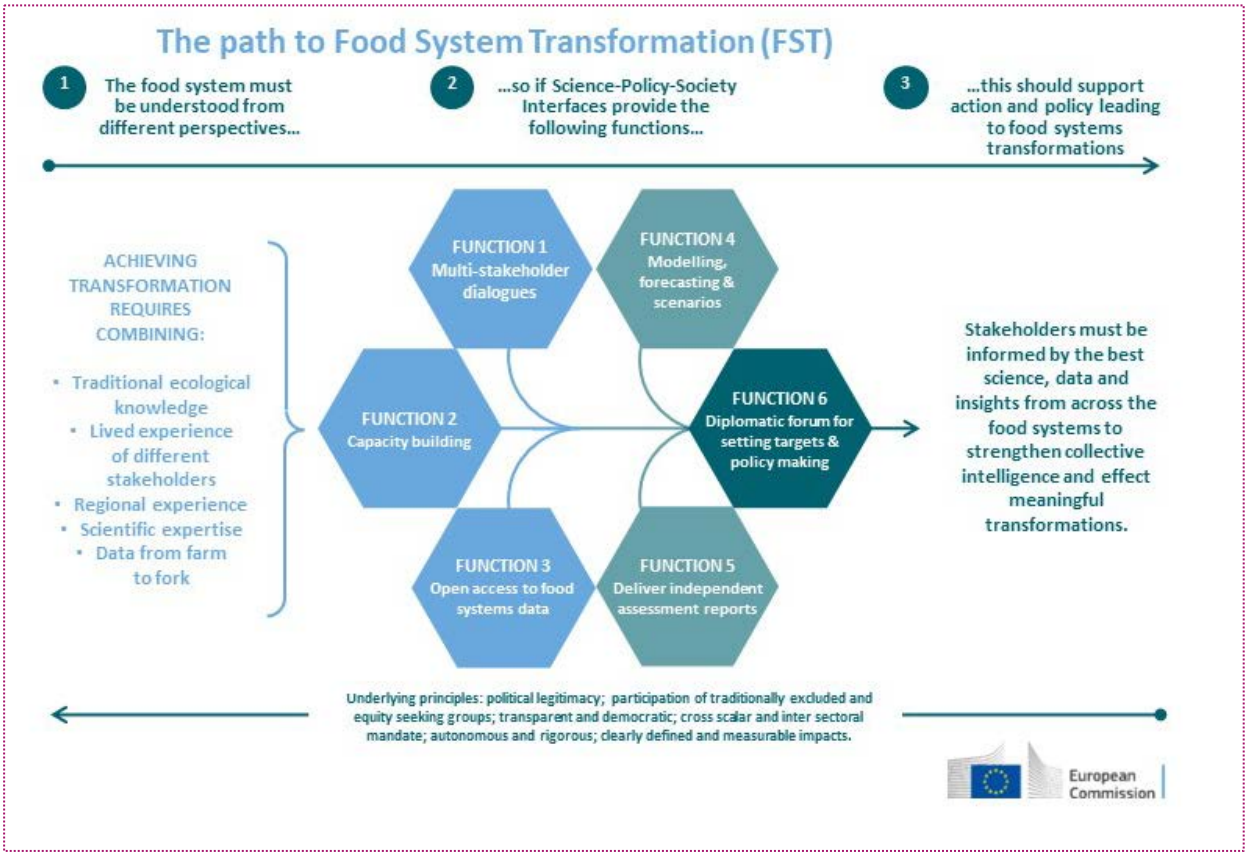
As an immediate consequence of those crises: food and nutrition security are back as a political agenda in a sharper way. It is also connected to higher political changes.

How long will the **food and nutrition security remain a political agenda**? Factually, there is an urgent need to get to change and achieve changes.

The very first part of the EC communication on "Safeguarding food security and reinforcing the resilience of food systems" is speaking of urgency. Furthermore, within the UN FS Summit, some decisions were made. Over 100 countries made commitments like pathways for FS transitions.

In addition to this, the HLEG committee started to work with 19 international experts and its report "Everyone at the table: Transforming food systems by connecting science, policy and society" is available. Any country that wants to move to FS transformation needs some context. It is not a blueprint, it is more a menu. Every country has to take into account its history, policy and institutions in place. The primary target audience for our report is politicians and policymakers.

When talking about FS transformation, another layer is added: the science-policy-society interface. To have a change, citizens need to be part of the process. The theory of change underpins the report.



Theory of change linking multiple perspectives on food systems (1) to the proposed functions that SPSIs must perform (2), through the policy outcomes (3).

To get into it, **capacity building and new skills** are requested and some other aspects like the open access to FS data. The following question will be at the heart of the debate at this conference and the SCAR Plenary on the next day: How can research and innovation influence and contribute to the increased political priority?

Keeping in mind the paths for transitions. What is at stake? – Jessica Duncan

Jessica Duncan, from the Foresight Group, was presenting the 5th SCAR Foresight report and proposed this question: keeping in mind the paths for transitions, what is at stake?

In foresight work, and her personal work dealing with politics of FS transformations, serious games are sometimes useful to illustrate concepts.

She introduced the *Parlour of Food Futures* (see pictures) by *Markéta Dolejšová* and asked the whole audience to think about the different categories and discuss them in groups of two. After that, she asked people to raise their hands when they considered them part of one of the categories.

Following this, she introduced the work done for the 5th Foresight exercise. The SCAR Foresight Group was asked to focus on transitions. There are specific goals to achieve by 2050. The expert group looked at these goals, back casted to the actual situation and identified the way to go there.

The Group identified 3 pathways to get to a safe and just operating space:

- healthy, sustainable diets for all,
- towards a circular food supply,
- and towards greater diversity.

This transition will require a systemic approach, a strong role of inter/transdisciplinary research, and identifying trade-offs that are coming, to support the politicians to find the courage to make the decisions to change the system.

What is the demand?

1. **Deeply social problems demanding social solutions:** structural challenges are not solved with technological innovations and complexity demands systems thinking.
2. **Science has a key role to play but we need to disempower dominant approaches.** There is a need to prioritise marginalised approaches to generate a much-needed understanding of obstacles to action.
3. **Recognise the politics of knowledge and knowledge-policy relations** while being aware that this is a marginalised and possibly marginalising position.
4. **Get comfortable with being uncomfortable if we truly want transformation**

To transform FS we need **democratic directionality**, which means having a debate and collective identification of collective goals to direct social-ecological transformation.

To engage in transformative FS research, researchers committed to science-policy aspects should be aware of the intended and unintended consequences of their research. They should push for a **plurality** of views (divergent). They need to increase **collaboration** and **transdisciplinary** approaches and also welcome changes through openness.

SCAR is a **think tank** and pan-European committee with different expertise and experiences. It has a key role to play in driving R&I in addition to supporting EU and national efforts.

SCAR has a great opportunity to identify **guardrails** for safe and just operating spaces and to influence policy and research. This requires systems thinking and enhanced collaboration across SCAR and beyond.

Strategies manage multiple evidence bases (stakeholders) therefore **social sciences and humanities** have a key role to play.

Through an enhanced political will, policy should shift towards supporting a more ambitious agenda of system transformation. There is a need for **openness** and willingness to identify competing understandings, visions and priorities and understand that disagreement can be a key driver for transformations. This mindset can help us to identify and better understand trade-offs in the future.

Jean-Marc Chourot took back the floor and explained the workshop process. All participants went then in sessions of twice 1,5 hours. They had the opportunity to attend 2 different thematic workshops (morning and afternoon). After this work in sub-groups, all participants went back to the plenary to listen to the wrap-up session given by the four workshops' Chairs.

Workshop 1: Digitalisation and use of new technologies

Workshop 2: Genetic resources and Agrobiodiversity

Workshop 3: Stakeholders and networks

Workshop 4: Skills and Education

Session 2: interactive workshops

Workshop 1: Digitalisation and use of new technologies

Chair: Jesper Stendal; Facilitation: Pille Koorberg.

Jesper Stendal took the floor at first to bring to the plenary the results of the reflection of the workshop on digitalisation and the use of new technologies.

The objective of the workshop was to highlight trends in the use of digital technologies to raise awareness of farmers regarding transitions. Three questions were giving guidance to the participants to achieve the objectives. See below the summary of the discussions per question.

Question 1: To which extent do digital and data technologies contribute to the green and digital transitions of the farming/food systems, please describe in a holistic/systemic view (so considering also the context, e.g. acceptance) which digital and data technologies would you propose and what would be the expected impact (positive and negative)?

Different aspects of the question were stressed by the participants.

Negative aspects and mistrust

Digitalisation means sometimes for consumers the loss of the "traditional" agriculture and a way to a more "artificial" agriculture. It means that citizens' perceptions can be negative against farmers using such tools. It raises the question of "Do we recognise only the agriculture we know?".

In the case of decision-making tools, sometimes you get adverse effects than the ones considered when conceptualising the tool. So, they have to be thoroughly designed.

One challenge of digitalisation is its necessary **holistic approach,** which is often in contradiction with the way researchers are working, meaning more in silos.

An issue is also the increasing amount of data available through those new technologies: the added value of this amount of data has been questioned.

Positive aspects

Usually, digitalisation helps farmers to get greener, but it is sometimes not obvious.

That "new technology" change aims to **lower the burden** on farmers.

Digitalisation can help to **monitor** agricultural systems (measure, report and verify = MRV) meaning that farmers get early warning systems and reliability of data, which enhance trust.

Data safety and confidentiality

Some aspects like **traceability, safety, privacy and confidentiality** of data were mentioned, in some cases, as positive. There could be consumers-oriented solutions and real transparency to the consumers. Some examples were given:

- Near-field Communication (NFC),
- QR codes for nutrition and Carbon footprint, etc.
- Apps to reduce waste, connect consumers with farmers,
- Apps collecting data from farms for market transparency, Farm Accountancy Data Network (FADN).

But then, when talking about the farmers, there could be an issue regarding the **farmers' agreement** to have their data used for such tools.

Needs and options for the future

Regarding farmers: digitalisation of agriculture and using digital technologies for transitions to new systems imply that farmers are **skilled** and ready to use new technologies. Therefore, those new skills have to be integrated either into lifelong training (older farmers) or educational courses (young or new farmers). This change means also a change of mindset and expectations of the farmers. Their role will change.

Regarding researchers: research on the **complexity** of transition could be considered as an opportunity for studying this holistic view mentioned above. This could bring to "absorb" or "process" individual knowledge and transform it into collective decisions.

There is a clear need for the **standardisation** of data for validation and evaluation purposes, also to enhance modelling and applications.

The example of Digital Twins was given to illustrate a possible future in smart farming.

Question 2: To which extent the role of the farmers/consumers/policy makers is well taken into account by research in the area of digitalisation and use of technology (highlight pitfalls and vulnerabilities)?

Infrastructure

The deployment of **infrastructure** is necessary to ensure the availability of digital technology and currently, the assumption is that digital infrastructure is available for everyone and everywhere, which is not the case.

Involvement of actors:

The **Multi Actor Approach** (MAA) is complex but important for finding solutions to complex questions. Involving the farmers from the start to develop digital solutions is key. Researchers have to adapt to end-user also in terms of capacity building and skills development. In the same direction, the collection of data should be based on questions or motivations coming from the farmers/end-user. There is a research potential when linking farmers' needs, to enhance uptakes.

It seemed very important to participants of the workshop that the **policymakers and farmers** should be **directly involved** in science dialogues, creating specific interfaces in this area. They should be involved in research design and development (Strategic Research and Innovation Agenda - SRIA). Nevertheless, the involvement of farmers in the development of digital solutions is still low and is probably linked to that population ageing.

Consumers are sometimes not that much aligned with digitalisation, it is difficult to change their habits. There is a clear issue regarding the **adoption** of new technologies. When you want end-users to adopt a technology, you need to provide **reliability and trust** to digital technology! Digital gives a lot of promises but end-users need to be convinced, and there is often reluctance also of farmers to new technologies. In that case, the social factor plays an important role, and the learning paths to use the technologies as well.

Data issues:

There is a clear need for **data sharing and harmonisation** to put all pieces together. For the moment, there is a clear lack of standardisation of data and data collection.

Also, the **interoperability** of data is important: the end-user is providing data to build relevant digital services, and data is to serve the end-user. Too much information can kill the information and the motivation to be involved. There is a need to bring back the context of data to make sense.

The future partnerships will **share research results**. Would that be feasible for the private companies that build their competitive advantage based on the confidentiality of results?

In addition to this, data ownership, data collection protection, the use of data and the protection of end-user have to be monitored and assessed. This is also a question of enhancing **trust and transparency** behind this. There are examples in public and private sectors with applications that are still not covering all aspects and products due to this issue. **Governments** have a role to play in creating public databases (e.g. on nutritional values, and environmental aspects of food) to lower the cost for SMEs in generating this information (e.g for labels).

Future

There is a chain effect to consider. Consumers have the **power** to change farmers also in direction of a sustainable food system model. Demand is a very risky topic for politicians to regulate.

Regarding public research, there is still a gap in making the right choices for citizens in terms of transition (diets etc). Healthy diets for consumers are connected to nutrition, which means that consumers need to learn how to read labels, "nutriscore", etc. From the consumer's point of view, databases and applications can be helpful. Through new technologies and digital, there are opportunities for **better communication**, to express real added value (true cost of products/services).

Extension services can play an important role as key brokers/mediators among technology providers and end-users, in both ways.

Question 3: Taking into account its level of maturity in this area, do you think that research can efficiently contribute to the transitions and what is missing?

As a general remark, the participants mentioned that research **can contribute** to the transition. However some elements are still missing (e.g. work on user interfaces, explanations/communications on how to pass on the best messages to end-users). There is still an important need to have a systemic and **interdisciplinary approach** to connect agri-digitalisation with the food chain. It would be interesting to map research needs and Strategic Research and Innovation Agenda (SRIA) regarding digital transformation.

Concrete needs were identified:

- The collaboration with farmers is including **trust-building** as a pre-requisite,
- **Data infrastructure and access** to broadband: there are research needs in gaps in infrastructure to increase the uptake, knowing that drones and satellites are not solutions for everything and there are specialised needs for animal health/welfare for example,
- One of the challenges is the **access to data** and the **fragmentation** of data: research needs to improve interoperability of data, develop protocols for sharing data, and enhance centralised networks of data. The data should follow the FAIR (findable, accessible, interoperable, retrievable) principle.
- Again, **building trust and confidentiality management** are important regarding the ownership of data (public-private): who controls this data and access to it?
- There is also a need for **standardisation** of data and data collection
- The **share and use of data** are at stake:
    - Same data used for CAP should be used for other areas – e.g. Green financing
    - Common platforms of research output including data (EU?) in open source (including control of data use and access)
    - Use free of charge Earth observation data (Copernicus) for research-based business models

- The transition means also a **transition in modelling**: research for modelling tools, business plans, seeing the future using digitalisation,
- Research still needs to identify the **end-users needs**, the cost, scale and benefits of technology. Would non-market value from the bio-economy be available through data?
- **Data production on trade-offs** (and synergies) among different outcomes of new technology or practice is missing,
- Considering that the farmers/consumers should continue to be masters of decisions despite all artificial intelligence surrounding, **socio-economic research** is highly needed,
- A specific issue identified was the **small-scale farmers** and how to reach them. Ideas were proposed like:
    - Incentives to change the small-scale farmers' mindset,
    - More tools to increase uptake regarding agroecology and precision farming,
    - Market research (especially for small farms) to inform about tech use,
    - Collaboration with farmers, tailoring advice for farmers,
    - Technology suitable for small-scale/family farms.
- The **consumers** are part of the challenge also: they need to understand and engage in food production, food waste etc. Will the end-user have the capacity to use all these technologies? There is a need for a minimum level of knowledge and capacity building. Education, awareness and usability are as important as data standards and limits,
- There was a suggestion to consider a supermarket showing the real/true food prices as a LL (in food system partnership).

After his speech, Jesper Stendal wanted to stress the need for the Agriculture of data partnership to have more countries and stakeholders join. SCAR is not yet able to tackle digitalisation sufficiently and should be handled cross-sectionally in all groups.

Before giving the floor to the second Chair, Jean-Marc Chourot mentioned that SCAR has to get out of the mainstream way of thinking and should bring new expertise in.

Workshop 2: Genetic resources and Agrobiodiversity

Chair: Nicolas Tinois; Facilitation: Véronique Rebholtz.

Nicolas Tinois provided the results of the workshop based on Genetic resources and Agrobiodiversity.

The objective of the workshop was to highlight trends in better use by people of ecosystem services for agriculture and food. Three questions guided the discussion. Below is a summary of the discussions per question.

Question 1: To which extent can nature-based solutions (agrobiodiversity) and genetic resources contribute to the agroecological transitions in farming and food systems; please describe in a holistic/systemic view (so considering also the context, e.g. acceptance) which use of nature-based solutions and genetic resources you would propose and what would be the expected impact (positive and negative)?

As a first step, it was agreed that agrobiodiversity should be considered at **different scales**:

- Landscape biodiversity
- Farm level
- Genetic resources/varieties/species

Incentives

Incentivising/financing the transition would be an option to enhance the transition also for "big farms" who might consider the cost of nature-based solutions as too expensive. At the landscape level, the eco-schemes could be activated (incentives through policy).

At farm level

Variety diversity and more **crop rotation** could reduce pesticide use. In the same way, biocontrol is used to avoid pesticides. **Old crop varieties** might help in terms of resistance to climate change and extreme conditions and in the same way, for livestock, there could be a focus on **traditional breeds**. Even if the traditional breeds are less productive, it is a question of choice between diversity and productivity. At the same time, improved breeds need high-quality feed while traditional breeds can be fed with sometimes residues (circularity). We need to consider the positive cycle and circularity between plants, livestock and soil. The actual **lack of protein** should be tackled as well.

Permaculture farms could be used as pilot areas to raise awareness about the transition to agrobiodiversity.

Sometimes the solutions implemented do not consider the longer outcomes (pesticides for ex.). In some cases, human intervention may disrupt the chains and cycles designed by nature and have an unforeseen impact. How to combine nature-based and science-based solutions?

Social acceptance

There is a need to enhance the education of citizens about agroecological products. There is a **social acceptance** to consider regarding those "old products" vs. "new products". At the same time, production needs to be profitable for farmers: how to inform and educate the consumers about it? Research is needed in this area.

Usually, consumers hearing Genetic resources think immediately about Genetic Modified Organisms (GMOs), and when they hear "Organic", they think about nature-based products. Genetic Resources should be related to the systems and better communicate.

Value Chain

Food processing can only handle standardised varieties, how to introduce diversity there?

There is also **food waste** to be considered at all levels: how can it be reduced? The regulation could be a solution.

The **real cost of food** should be revealed to consumers pointing out the unsustainability of some cheap products.

Question 2: To which extent is the role of the farmers/consumers/policy makers well taken into account by research in the area of genetic resources and agrobiodiversity (highlight pitfalls and vulnerabilities)?

In the last years, there have been significant improvements in the involvement of the different stakeholders through **different tools** with MAA, Operational Groups, LEADER, Local Action Groups, etc. But the level of involvement of the different stakeholder groups (farmers, researchers, policy makers, consumers…) is different from one group to another. The involvement of the different groups needs **prerequisites**, otherwise, the common action might be counterproductive. There might be some pitfalls/problems to overcome linked to **jargon** and **languages** used by the different groups.

The role of **brokers** is essential as they are independent in these discussion forums and can put forward farmers' interests to be taken into account in meeting their needs. Otherwise, farmers working with researchers might be afraid to work more to help the researchers than to tackle their own challenges.

Researchers are taking into account policies as they seek funding in those areas. A mix of **basic and applied research** is needed. There is a clear need to involve citizens and farmers from the beginning and social discussion needs to happen on how to use these findings.

Another point raised by the participants is that in MAA implemented in research projects, most researchers involved are "senior" researchers (60+), who have nothing to prove anymore. Most of the young researchers are still working in **silos**. They need to consider the big picture and work more **interdisciplinary** otherwise there might be some pitfalls.

- ***What to do to support the Researchers to be fit for the future?*** Long-term and short-term aspects have to be considered.

Question 3: Taking into account its level of maturity in this area, do you think that research can efficiently contribute to the transitions and what is missing?

Research can contribute to the transitions and can help to make space for more agroecology on the farms, but identified **gaps** and needs are listed below:

- Knowledge of the rotations with legumes
- Research on animal breeding for organics
- More efficient tools to bring knowledge to end-users
- Understanding and communicating the value of Genetic resources and biodiversity
- Social science has to be enhanced specifically regarding the behaviour of consumers (pricing)
- Microbiome is hardly known and is one big research gap, that could answer the climate change mitigation etc.
- Roots systems are not so well-known
- Mixed farming in connection with plant and animal production on-farm and processing of the products

- Knowledge reservoir from traditional knowledge has to be recovered (indigenous people's knowledge)
- Data combination should help to understand changes in land use and which transition can be found in practice

In addition to this, some questions are also pending:

- Are New Breeding Techniques (NBT) compatible with Agrobiodiversity?
- How to bridge the gap between productive and non-productive functions of agrobiodiversity?
- How to monitor the transitions?

Interdisciplinarity and holistic approach

There is a need to include room for **directed and non-directed research**, especially regarding Agrobiodiversity.

What is the level that matters most between landscape, species and genetics? We need to consider the big picture and have a **holistic approach**. Sometimes we are looking at the different levels separately when they should be looked at together. This requires different policies, approaches, stakeholders and methodologies.

Next steps for researchers:

Several questions are at stake:

- How to add an economical value to Agrobiodiversity?
- What is the economic **incentive** to promote those new ways of land use?
- On the contrary, should it be a **tax** for unsustainable systems?
- How to adopt and implement the new sustainable practices coming from research? That needs the involvement of **social sciences** and that of other types of stakeholders (farmers etc.). Today we consider optimisation of systems towards one trend, but we need to make optimisation at a more general level, and consider trade-offs too. There are also "bigger" aspects to consider like machinery, attitudes, practices or advisory services.

In conclusion, if we breed the plants to resist pests and have plasticity and resilience, then the "bumble bee" will be happy.

Workshop 3: Stakeholders and networks

Chair: Monique Axelos; Facilitation: Edelbis Lopez Davila.

The objective of the workshop was to identify and better understand the new relationships between farmers and other stakeholders in the frame of transition. Two questions were giving guidance to the participants to achieve the objectives. See below the summary of the discussions per question.

Question 1: Which modalities and conditions for successful relationships between farmers and other stakeholders, including consumers and citizens, along the value chain to accelerate the transition towards sustainable food systems? Subtitle: Recipes for success?

The participants identified interconnected main focus points, each of them having several attention points:

- Communication
- Interaction(s)
- Process/education/governance

Communication:

It has to be simple and attractive with good examples indicating the role of pioneer farmers and advisors.

- What means sustainable? What are sustainable Food Systems (FS)? How to move from today's systems toward Sustainable FS tomorrow?

It should provide a convincing **narrative**, having the end-user at the centre and using the 'beauty and richness of food (systems)' as a starting point instead of the negative issues. It should focus on **dialogues** and solving a specific problem, not an information push.

These actions should be included in a **clear communication strategy** considering also the past as a fundament and source for the future.

The key words would be trust, openness and honesty while dealing with uncertainties.
Communication should stress that **we are all responsible** (not just pointing at others).

Interaction(s):

There is a necessity to capitalise on **MAA** through EIP-AGRI operational groups for example. Living Lab environments in the broadest sense could also be considered, from local labs (communities of practices) to exemplary regions.

In the case of the participation of farmers in research projects, there are issues: generation consideration and **equality** between partners. Farmers should not feel like just "objects of research".

Interaction between actors can be considered in different ways: MAA, but also contractual arrangements between diverse stakeholders, including consumers. It should consider power balances and joint responsibilities between farmers, advisors, processors, retailers, consumers, etc. The next step would be to explore interactions within networks and in between networks.

To get stakeholders engaged, showing examples close to them like the local bakery could be the first step, but then, considering the global systems would be the next one. The following question linked to it is the "how?". There is a need in finding an optimum between diversity in examples and common features.

Process/education/governance:

Public policies have a role to play (including research policies) in reducing risk and facilitating the participation of various stakeholders.

Capitalising on existing mechanisms (e.g. procurement) could give guidance. The collection of information from diverse models, by building databases and exploring (farm)books would help to understand the contextual usage. Of course, in this context, the language barriers will have to be overcome.

Research could explore if cases are scalable, reproducible, and transferable through understanding their robustness, performances and contextual functioning.

Education on 'food' should be set from a young age (schools), but not exclude lifelong learning.

A balance between institutionalised and individual pathways for change (top-down vs bottom-up) should be considered.

Question 2: Do you think that research can efficiently contribute to the transitions and what is missing?

For sure, **research can contribute** to the transition and it is the engine of transition to sustainable food systems. But, it is important to make a difference between efficient or effective contributions to the transition. Research might not be efficient at first but effective.

We need to distinguish between research already performed and the one contributing directly to the transition. Here the question is how we communicate, who should communicate, and who should raise awareness about this?

Long-term perspective research should be kept as a strategic priority to be able to react immediately if needed (example of the COVID vaccine development based on past research results).

In the context of already made research, we need to develop the **monitoring for data sets**, and **methodology** to harness the data in a systemic cross-sectoral way, to be able to translate the research results into valid policy options.

Here are the **top 3 areas** of research to strengthen to facilitate the transition to SFS according to the workshop's participants.

Policies

Political will must be in favour of the transition of the society. Money motivates the transition, but how about food security? The **true value of food** should guide the policies.

Multi Actor Approach

It is **a must**, current models of making science are too often done in silos. Science can build and facilitate interfaces.

Farmer science, different fields of research, and EU-global actors, all these are important **interfaces** in the transition. The MAA works in creating the research questions too!

Researchers must learn to listen to the different actors and the differing agendas.

Stakeholders oriented sciences

They are very much needed to understand the Food Systems (FS) dynamics and actor interaction. There is a need to identify new **KPIs** for science and think about how the results are impacting society. There is a need to **rethink the role of social sciences**. The new research and innovation agenda should be built with a new setup, to be driven on equal foot by social sciences and technical/sector-related science.

Practice-based science could have a role in highlighting key examples.

Mission on FS should be phrased to be able to concentrate different sectors and priorities on the FS.

Due to consecutive and accelerated shocks and crises we should be able to go back and **assess our research priorities and findings**. There might be a need to reshuffle priorities.

SCAR

Considering the SCAR, the **role** of Strategic Working Groups (SWG) could be rethought. The SWG could be a delivery platform for specific discussion on specific subjects inviting the right experts from the ministries and research institutes.

Workshop 4: Skills and Education

Chair: Pascal Bergeret; Facilitation: Karme Petrutis.

The objective of the workshop was to identify the skills that will be required shortly given changes in daily activities and jobs in agriculture and their accessibility. Three questions were giving guidance to the participants to achieve the objectives. See below the summary of the discussions per question.

Question 1: How to prepare [future] farmers, actors including citizens along the food chain to contribute to transitions? For humans in transition, skills and education make sense.

For future farmers:

- The first step to developing **skills** of future farmers is through education and life-long learning;
- **Interdisciplinary** research, farmers oriented should be set up properly;
- **Applied research** is very important with calls to action and implementation of the knowledge;
- It is strategic to pay attention to **differences between countries** regarding their response to crises or the production of their own food;
- There will be a need to **value farmers** and their actions and transition to motivate and encourage the farmers;
- A **common language** between older/younger generations should be developed;
- Future farmers will need to adapt to **EU strategies**;
- **Protect** farmers from the negative pressure/effects that will be needed to avoid discouragement.

For citizens:

Learning new systems will start early with young people both at home and in schools through:

- Valuing high-quality food,
- Eating organic/local food,
- Learning about transition and its needs, visiting farms,
- Composting, processing food,
- Understanding food value: food is not cheap,
- Knowing actors in the systems

The next steps would be to change the curriculum (admin skills and so on) and make the young generation of citizens **aware and critical** regarding fake news (importance of science-based knowledge!).

To do so, research has to reach consumers through mass media for example. Scientific information should be easily available. Citizens have to be encouraged and involved in projects to develop empowerment. This empowerment should happen through the cooperation between the public and private sectors.

Question 2: How to anticipate requirements for new skills and what role for academic systems and other stakeholders?

"New" skills required in the future will be **technical** skills, but also **political** skills (negotiation, how to provide support).

The role of academic systems will be to provide those "new" skills through **initial training** (attract, raise interest) and continuous **lifelong learning**. They will have to adapt to farmers after finding out what they need.

As a principle, the learner must be in the centre of all the training process and all the important actors, like farmers, advisers and so on, must be associated.

To set this up, there is a need for **anticipation** with the help of research (calls/publications) through stakeholder consultation, demonstration/experimental farms and support to pioneer farms/LLs. Scientists need information on what to change in the current system, they must define gaps and show pathways. Research and Innovation needs to get closer to farmers to contribute to this.

The **private sector** should also be consulted in this area, like the farmers' associations etc.

The pending important question is what to do if farmers do not want to change? It should be properly considered. The solution suggested by the participants was that the farmers will "follow the money", meaning that the policies should be built accordingly.

Question 3: Taking into account its level of maturity in this area, do you think that research can efficiently contribute to capacity building and what is missing?

This question was reformulated by the group in: **How can R&I better support capacity building?**

As a matter of fact, for the workshop's participants, education and skills are of high importance to achieve the transition, but is it a **political priority**?

Change is needed

Capacity building is needed at all levels through a wider/systemic approach and cross-functional work. The main aspects are the need for innovation/innovation brokers, transdisciplinary, and diversified skills.

We need also "deeper" conversations with different actors of the system regarding industry-environmental-related issues; food-waste issues, etc.

Organisational change within the curriculum must be implemented: there is a need to integrate social sciences and new forms of collaboration, but also culture, local solutions and history should be considered. The education systems should be analysed (Pan-EU/macro-regional assessment of education/training).

R&I has to go more into practice with extension to the field, LLs. Skilled persons should be involved.

Farmers

How well can they adopt R&I knowledge (some very skilled/direct contact with researchers)?

They should be considered as **research partners**, but also as **users** of the research results. Therefore, incentives and compensation should exist for farmers to participate in research projects.

There are already ways to involve farmers in knowledge exchange like open gates, demonstration farms and private-public partnerships.

Researchers

Researchers can use **big data** more actively/efficiently nowadays but should also consider the needs (more efficiency, saving costs) and data from smaller farmers.

The way research is evaluated might become an important aspect in the future: which scientific metrics should be used for **evaluating** research impacts? There is also a need for different awarding mechanisms!

Innovation and development of new, emerging and fresh ideas are important and building the good conditions for it also.

We have to consider **vested interests**: the Issue of conflict of interest is always at our door and we have to be cautious.

SCAR

It should support a **concrete process** to work **across Working Groups** and get a deeper stakeholder engagement. The SCAR should find the needs of the whole food supply chain regarding transition levers. In addition, it should consider new thematic, fresh formats (for example virtual) and include social sciences in the debates.

This last speech finalised the wrap-up session from interactive workshops. Jean-Marc Chourot introduced the next speakers to give some concluding words of the conference.

Session 3: Learnings and Conclusions

Peter Wehrheim, Head of Unit "Food Systems and Bioeconomy" at DG Research & Innovation, took the floor to give some closing words after the feedback given by the different workshop Chairs.

He thanked the entire French Presidency team, for inviting and hosting the conference and the SCAR Support Team, who helped facilitate this whole inspiring day. After such a long online period, it was of great relief to have this kind of physical meeting.

Considering the recent multiple crises, COVID-19 and the war on Ukraine, crisis preparedness and resilience are now a top priority and should be part of all actions regarding transitions of systems.

His highlights of the day were connected to SCAR and its mission. The two keynote speakers emphasised the need for science-policy interfaces and the necessary transitions.

Tom Arnold officially launched the final report on behalf of the EU HLEG "Everyone at the Table: Transforming Food Systems by Connecting Science, Policy and Society" and gave an overview of its main outcomes, both to inspire and inform discussions on how to **strengthen international science-policy interfaces** (SPI) for improved food systems governance. The 3 recommended pathways he mentioned: 1- Adapt the current landscape using additional resources under a broader mandate; 2- Enhance the current landscape with multisectoral task forces; 3- Coordinate agendas by creating a 'network of networks' of SPIs for food systems are showing a possible way forward. Furthermore, he gave actionable advice to take to the ministries/institutions and support the different countries in enforcing beneficial SPIs.

Change is sometimes uncomfortable, and **Jessica Duncan** introduced the different possible food futures through a Tarot game. She also showed that we jointly need to think outside the box and imagine new futures. She then highlighted the 3 transitions identified by the 5th SCAR Foresight report, that seem more pertinent than ever: **Healthy diets** for all, **Circular economy**, and **Diversity**. These transitions are cross-cutting and need the attention of all SCAR groups with their different expertise and a holistic view, complexity cannot be taken out of the challenges and their solutions.

This guidance needed to be put into practice within the four different workshops on 1) Digitalisation and use of technologies 2) Genetic resources and Agrobiodiversity 3) Stakeholders and networks 4) Skills and Education.

Participants have identified how these different areas of the workshops contribute to the transitions, their impact, positive and negative, and suggested main future directions that are relevant for the work of all SCAR WGs as well as the candidate partnerships.

SCAR is an **important lever** for driving R&I and needed transitions and has a role to play in connecting science with policy to address Europe's challenges in agriculture, fisheries, food systems, forestry, and the wider bioeconomy. SCAR has proven a cross-cutting way of working today in which issues are tackled with a holistic approach, allowing for closer cross-fertilisation among the various groups.

SCAR has already shown to work cross-cutting by being a convening platform for the four Candidate Horizon Europe partnerships that will be forward-looking, and work in a cross-cutting way while truly complementing the Horizon Europe Work Programme and the Missions, especially the Soil Mission.

He finished his speech by making the link with the SCAR Plenary on the next day and wishing all participants a wonderful evening and dinner. He gave then the floor to Joao Onofre.

Joao Onofre, Acting Director DG AGRI.F - Outreach, Research and Geographical Indications at DG AGRI - started by mentioning the pleasure to meet some colleagues for the first time during this conference and the great opportunity to share with the participants some thoughts after a day of interesting discussions.

The **European Green Deal** has put forward ambitious targets for the agri-food and forestry sectors, posing challenges to all the actors involved, but notably, to farmers and foresters.

Europe has several tools at its disposal to support them in these endeavours. To start with, the **Common Agricultural Policy** (CAP), with its new delivery model, is better tailored to address the specific needs of Member States, and with its increased attention to reward farmers for adopting practices that are respectful of the environment.

Connecting to the themes of today's workshops, the European Commission has already devoted substantial financial resources to support research that is helping farmers work more precisely, efficiently and sustainably through **digitalisation**.

Genetic resources play a crucial role in our agricultural and forest-based research activities, and so does improving agrobiodiversity to find solutions that help farmers transition from conventional, synthetic input-intensive farming approaches, to other more 'knowledge-intensive' such as organic farming or agroecology.

The relationships among **actors** are also a central element of research and innovation activities. For several years now, we have implemented the **MAA**, by which we explicitly request that several key stakeholders (farmers, advisory services, breeders, industry, etc.) are genuinely involved in the project from the beginning and that the project objectives must be targeting the needs and opportunities of end-users. This approach has become a cornerstone of the research done on agriculture, forestry and rural areas, and is inspiring other Clusters under Horizon Europe that are also increasingly taking up the MAA in their work programmes.

With Horizon Europe, we are aiming at taking the multi-actor approach a step beyond and promoting the establishment of **living laboratories** where different actors come together in real-life environments to co-create and test solutions to challenges that farmers face in specific contexts. Two of our biggest initiatives under Horizon Europe – the Mission 'A Soil deal for Europe' and the future partnership on agroecology will be based on living laboratories as implementation tools.

The multi-actor approach links our Common Agricultural Policy, and notably the European innovation partnership for agricultural productivity and sustainability (EIP-AGRI). More than 2500 Operational Groups work today, and many more will come, as the EIP-AGRI is reinforced in the future CAP.

Finally, the Agricultural Knowledge and Innovation Systems (**AKIS**) will play a key role in future CAP plans. Member States are asked to follow a strategic approach to ensure that knowledge exchange and innovation will interlink AKIS actors regularly. Mr Joao Onofre mentioned specifically the role of advisors, who can play a fundamental role in steering and influencing farmers' decisions. Part of research priorities, therefore, focus on reinforcing the role of advisors.

His conclusion was to capitalise on the tools and innovations that we have at hand and take them a level above to support all actors in this transition. The **complexity** of the challenges to be addressed requires concerted and integrated research efforts at the European and global levels. There is a need to use the initiatives, new approaches and instruments that allow for more collaboration and synergies at national, regional, and local levels.

In that context, the upcoming partnerships under Cluster 6 will play a fundamental role in addressing the challenges. The SCAR, through its unique role as a forum for discussion and development of coordination of R&I among the Member States, will be key.

After this last speech, the SCAR Conference has been closed by Jean-Marc Chourot, inviting the participants to join the social event in the evening.

Annex – Participants list

Title	Name	First Name	Country
Mr.	Magnus	Isabelle	BELGIUM
Mr.	Popov	Vladislav	BULGARIA
Mrs.	Beric	Dasa	CROATIA
Mrs.	Srdarev	Anita	CROATIA
Mrs.	Štejnarová	Šárka	CZECH REPUBLIC
Mr.	Veselský	Marek	CZECH REPUBLIC
Mrs.	Heimann	Bettina	DENMARK
Mrs.	Nielsen	Vivi Hunnicke	DENMARK
Mr.	Stendal	Jesper	DENMARK
Mr.	Thomsen	Bjarne	DENMARK
Mrs.	Tänav	Tõnis	ESTONIA
Mrs.	Huttunen	Minna	FINLAND
Mrs.	Nikkola	Elina	FINLAND
Mrs.	Ryynänen	Suvi	FINLAND
Mrs.	Tolvanen	Anne	FINLAND
Mr.	Albina	Emmanuel	FRANCE
Mrs.	Axelos	Monique	FRANCE
Mr.	Bardy	Marion	FRANCE
Mr.	Bergeret	Pascal	FRANCE
Mrs.	de Vries	Hugo	FRANCE
Mr.	Deconinck	Koen	FRANCE
Mrs.	Le Gal	Antoine	FRANCE
Mrs.	Proust	Rémi	FRANCE
Mrs.	Terzieva	Anastasiya	FRANCE
Other	Tourneur	Léa	FRANCE
Mrs.	Vanni	Francesco	FRANCE
Mr.	Ziebinska	Urszula	FRANCE
Mr.	Bassler	Arnd	GERMANY
Mr.	Heidelbach	Olaf	GERMANY
Mrs.	Noske	Andrea	GERMANY
Mrs.	Saggau	Elke	GERMANY
Mr.	Tinois	Nicolas	GERMANY
Mrs.	Juhász	Anikó	HUNGARY

Mr.	Kovacs	Barna	HUNGARY
Mr.	Kristóf	Ákos	HUNGARY
Mr.	Kelly	Raymond	IRELAND
Mrs.	Ní Choncubhair	Órlaith	IRELAND
Mr.	Walsh	Karl	IRELAND
Mr.	Grando	Stefano	ITALY
Mrs.	Puliga	Serenella	ITALY
Mrs.	Pilvere	Irina	LATVIA
Mrs.	Kraujalytė	Vilma	LITHUANIA
Mrs.	Zangerlé	Anne	LUXEMBURG
Mr.	Giuliano	Stephen Joseph	MALTA
Mr.	Bollerman	Sascha	NETHERLANDS
Mrs.	Boselie-Abbenhuis	Floor	NETHERLANDS
Mrs.	Langthaler	Gudrun	NORWAY
Mrs.	Cieslikowska	Justyna	POLAND
Mr.	Dabrowski	Bartosz	POLAND
Mrs.	Foks	Agata	POLAND
Mrs.	Hrenova	Jana	SLOVAKIA
Mr.	Javůrek	Václav	SLOVAKIA
Mrs.	Erjavec	Ivana	SLOVENIA
Mrs.	Esteban	Esther	SPAIN
Mr.	Vancanneyt	Guy	SPAIN
Other	Willener	Astrid	SWITZERLAND
Mrs.	Chandler	Caroline	UNITED KINGDOM
		TOTAL	**57**
Speakers, EC and Organisational team			
Mrs.	Lopez Davila	Edelbis	BELGIUM
Mrs.	Rebholtz	Véronique	BELGIUM
Mr.	Cavitte	Jean-Charles	EC
Mrs.	Fabbri	Karen	EC
Mrs.	Gaona Saez	Susana	EC
Mrs.	Lüth	Daniela	EC
Mr.	Lutzeyer	Hans-Jörg	EC
Mr.	Onofre	Joao	EC
Mrs.	Rosenow	Kerstin	EC

Mrs.	Teixeira	Débora	EC
Mr.	Wehrheim	Peter	EC
Mr.	Koorberg	Pille	ESTONIA
Mrs.	Petrutis	Karme	ESTONIA
Mr.	Baduel	Valérie	FRANCE
Mr.	Cécillon	Lauric	FRANCE
Mr.	Chachia	Nezha	FRANCE
Mrs.	Chourot	Jean-Marc	FRANCE
Mrs.	Dufour	Eric	FRANCE
Mrs.	Mlala	Sofia	FRANCE
Mr.	Portier-Maynard	Anne	FRANCE
Mr.	Puech	Anne	FRANCE
Mr.	Renard	Philippe	FRANCE
Mr.	Arnold	Tom	IRELAND
Mrs.	Duncan	Jessica	NETHERLANDS
		TOTAL	24

TOTAL Participants: 81