SCAR FOOD SYSTEMS Strategic Working Group

Terms of Reference

2019 – 2022

Terms of Reference

TABLE of CONTENTS

Terms of Reference

NAME OF GROUP: SCAR FOOD SYSTEMS Strategic Working Group – (SCAR FOOD SYSTEMS SWG)

INTRODUCTION- SHORT DESCRIPTION OF THE STRATEGIC WORKING GROUP

The main rationale for the SCAR FOOD SYSTEMS SWG is that the SCAR member states provide strategic advice and support to the EU Research & Innovation (R&I) policy framework **FOOD 2030**[1]*, **Horizon Europe** (in particular Cluster 6, '**Food, Bioeconomy, Natural Resources, Agriculture and Environment**'), Green Deal, as well as to the update of the "Sustainable Bioeconomy for Europe: strengthening the connection between economy, society and the environment", in which food systems plays an important role in terms of turnover and employment.

Food is defined to be edible products derived from land or sea (including inland waters) destined for human consumption or animal feed. In this sense, food is more than just biomass as input for life support, bio-fuel or bio-based products. Food has relevant historical, social, cultural, geographic, environmental and economic dimensions. Currently the EU and global Food systems are affected by major societal and interrelated challenges such as climate change, loss of biodiversity, migration, a growing world population, urbanization, resource scarcity, triple burden of malnutrition (undernutrition, overnutrion, and hidden hunger), ageing and food poverty.

The SCAR FOOD SYSTEMS SWG recognizes that food systems **should not only deliver food security but also nutrition security**. Food Systems are considered to produce and provide sufficient, affordable, accessible, safe, convenient, tasty and nutritious food for healthy and sustainable diets for all citizens. Food systems also need to be environmentally sustainable ('resource smart'), implying a sustainable and efficient use of natural resources, and limiting negative environmental impacts.
In this respect, food systems building blocks should encompass entire value chains in their widest forms and their interactions; from ecosystem services, primary production (agriculture, aquaculture & fisheries), harvesting, storage, processing, packaging, distribution, retailing, service sector (e.g. HoReCa, canteens, catering), waste stream and co-product management and recycling, food and feed safety, to consumers, nutrition for citizens' health & well-being, and diet related diseases.
The food sector is therefore interconnected with many other sectors like the (bio-based) material sector in case of co-product valorization, the (bio-)energy sector for waste and co-products as energy sources and energy input for all steps in the chain, the technology sector for novel technologies including ICT, the health sector regarding the relationship between food and health, the tourism sector for multi-functional agriculture, the transport sector for both globalized food chains and local-to-local production concepts, etc.

To ensure Food and Nutrition Security (FNS), the European R&I policy agenda should focus on future-proofing food systems by making them more sustainable, resilient, responsible, diverse, competitive, and inclusive. This will contribute reaching the Sustainable Development Goals (SDGs priorities) by 2030 and it will contribute to the FOOD 2030 priorities: NUTRITION for sustainable and healthy diets, CLIMATE

[1] http://ec.europa.eu/research/conferences/2016/food2030/pdf/food2030_conference_background.pdf#view=fit&pagemode=none

smart and environmentally sustainable food systems, CIRCULARITY and resource efficiency of food systems, INNOVATION and empowerment as well as engagement of communities.

As Research and innovation (R&I) is key to find impactful solutions to future-proof food systems, it is relevant to avoid fragmentation, ensure policy coherence and adopt a whole food system approach to be sufficiently impactful, however also to find solutions that are best adapted regionally.
For this reason, the SCAR FOOD SYSTEMS SWG will continue to provide strategic intelligence and orientation by integrating and analysing the different regional, national, European and international initiatives in place. This will allow for sharing of best practices, knowledge and data, and stimulate the standardization and harmonization of policies, monitoring and R&I policy alignment within and amongst SCAR Member States as well as with the non-EU countries that are participating in the EC's International Bioeconomy Forum (IBF), hereby taking into account the regional specificities and further strengthening the rich and diverse European Food Kitchen.

Based on the work carried out by the SCAR FOOD SYSTEMS SWG during the period 2016 – 2019, a second mandate is timely and relevant, given the recent policy and political development such as United Nations 2030 Agenda, the Paris Climate Agreement, FOOD 2030 agenda, Horizon Europe (cluster 6), the need for input to the UN Strategic Development Goals (SDGs) and the European Green Deal proposed by the new President of the European Commission for the next Commission 2019-2024 aiming among others at developing a new "Farm to Fork" strategy on sustainable food along the whole value chain and a new Circular Economy Action Plan.

The SCAR Food Systems SWG new mandate will elaborate further on the understanding of complex adaptive food systems at different levels and the development of a methodology for studying and exploring food systems for policy making and innovation actions **(A1).** This requires the development of indicators to be used and assessed with the ambition to monitor progress towards the four priority areas of the Food2030 initiative **(A2).** However, this implies an effective translation of science outputs to policy practice to be proposed in the form of best practice guidelines and the usage of policy briefs **(A3).** For adoption of policy measures, the engagement of actors and especially consumers / citizens is imperative; different participatory schemes will be analyzed and elaborated in different MS **(A4).** As a transversal action and highly relevant for understanding the potential of food systems, specific attention will be paid to most efficiently using agro resources and reducing the high percentages of food waste today **(A5).** Finally, food systems at the interface of food and technology sectors are addressed in the action on digitalization **(A6).**
These 6 actions have been identified after consultation and brainstorming with the SCAR FS SWG members:
Action 1: Food systems of the future
Action 2. Monitoring impact
Action 3: Translate science into policy
Action 4: Consumers and Food Systems
Action 5: Food system waste management
Action 6: Digitalization (DG) and Artificial intelligence (AI)

1 ORGANISATION

1.1 Coordinator

The SCAR FOOD SYSTEMS SWG is coordinated by France. Responsible contact person:
Monique Axelos
Science director "Food, Nutrition & Bioeconomy", INRAE (French National Research Institute for Agriculture, Food and Environment)
monique.axelos@inrae.fr

1.2 SCAR contacts/liaison

Marion Bardy Marion.Bardy@Agriculture.Gouv.Fr
Jean-Marc Chourot jean-marc.chourot@agriculture.gouv.fr
Isabelle Albouy isabelle.albouy@inrae.fr

1.3 Timeline

Date for the Terms of References to be approved by SCAR Plenary: December 6th , 2019
Duration of the SCAR FOOD SYSTEMS SWG: 3 years from December 2019 to December 2022.

Annually the bi-annual work plan will be established/updated and tabled with SCAR Steering Group meetings for discussion and approval.

1.4 Participants

Members States of the SCAR FOOD SYSTEMS SWG are: AT, BE, DE, DK, EE, ES, FI, FR, HR, HU, IE, IT, LT, LV, NL, NO, PL, RO, SE, TR, UK.
The SCAR FOOD SYSTEMS SWG is open to all SCAR participating countries. Member States that wish to join the SWG at a later stage should address their request to SCAR SG and the SCAR FOOD SYSTEMS SWG.

The SCAR SG representative of each participating Member State should inform, in writing, the SCAR FOOD SYSTEMS SWG chair and the SCAR Secretariat of their national appointed and mandated representative(s) as well as changes that may occur in the lifetime of the SWG.
Joint Programming Initiatives relevant to the FOOD SYSTEMS SWG such as FACCE-JPI, JPI HDHL, JPI OCEANS and WATER JPI are welcome to participate in SCAR FOOD SYSTEMS SWG meetings as observers.

Both DG RTD and DG AGRI will actively participate in the meetings of the group. Other EC Services such as for example JRC, DG SANTE, DG CNECT, DG GROW, DG EAC, DG CLIMA, DEVCO, DG MARE, DG ENV, DG REGIO may be invited, in agreement with the SCAR SG and SCAR FOOD SYSTEMS SWG, to participate in meetings when deemed relevant or necessary. The same holds for the SCAR Bioeconomy SWG, Fish SWG, AKIS, Sustainable Animal Production CWG and Animal Health & Welfare CWG.

1.5 Logistics

Considering the key role of the SCAR FOOD SYSTEMS SWG, 3 meetings per year will be scheduled over a 3 year period. Additional activities will include workshops and annual events. Meetings should alternate in Brussels and other Member States. Efforts will be made to meet at different Member State locations to see national implementation of food systems.
Because of its transversal area the SCAR FOOD SYSTEMS SWG will align its work and will collaborate with all relevant SCAR SWG/CWG groups in order to avoid overlap and duplication and create benefits to their activities.

For every meeting a small taskforce will be formed to prepare this meeting and to translate the outcome into deliverables. A possible agenda for a two-day meeting could be for example: day 1, creative workshops with external experts on the selected topic, with a concrete deliverable(s) at the end of the day (report, presentation etc.); on day 2 work meeting of the SCAR FOOD SYSTEMS SWG members to discuss results, exchange information and prepare the next steps and the next meeting.

1.6 Resources

Resources from Member States, in cash or in kind. External resources should be sought for support activities (e.g. desk research, surveying and analyzing of data gathered, expert support, workshops, dissemination events, etc.).

2 AMBITION, WORK, OUTCOMES

2.1 Rationale

The SCAR FOOD SYSTEMS SWG will contribute to the:

- Development of the European Green Deal and its new "**Farm to Fork strategy**", to accelerate the transition towards more sustainable and socially just ways of producing, consuming and trading, while preserving and restoring our ecosystems.
- The successful implementation of the UN Sustainable Development Goals **(SDGs)** and the **COP 21 commitments.**

The FS SWG promotes the development and shaping of Food System R&I Policy implementation at the level of the **European Commission** (DG RTD, SANTE, AGRI, CNECT; JRC, etc.)

The FS SWG provides strategic advice and support to:

- DG RTD's Food and Nutrition Security Policy Framework "**FOOD 2030"** and the **Cluster 6 of HorizonEurope.**
- DG RTD's **Updated Bioeconomy Strategy (2018)** as food plays a key role in Bioeconomy.
- DG RTD's International Collaborative activities and the International Bioeconomy Forum **(IBF)** on Food Systems relevant areas.

The SCAR FOOD SYSTEMS SWG will respond to Member state needs on:

- informal exchange on national FNS related policies and strategies and their implementation in different action areas (e.g. exchange whether there is a food waste reduction strategy within an existing national bioeconomy strategy or other strategies),
- exploring and assessing national R&I strategies to future-proofing of Food Systems,
- supporting MS in their implementation of more efficient R&I initiatives and policy coherence for Food and Nutrition Security.
- helping Member States to bring the message at greater European political level (EC, Council, EU Parliament etc.)

During its new mandate (2019 -2022), the SCAR FOOD SYSTEMS SWG will continue to help move towards better FNS R&I policy coherence as well as FNS R&I strategic orientation by integrating and analyzing initiatives and strategies.

There are currently many groups, organizations and platforms that have established a range of FNS related strategies and policies such as the FAO, OECD, UN, EU or MS coordinated actions (e.g. JPIs, ERA-NETs, EJPs, KICs, ESFRI, GODAN, SAM-SAPEA WG on food systems, BIOEAST Food Systems WG, the EU Platform on Food Losses and Food Waste (FLW) etc.), industry partnerships, MS ministries and research organizations. Furthermore, the EU, national and regional strategies and policy developments relevant to FNS tend to be fragmented with the risk to become incoherent. The SCAR FOOD SYSTEMS SWG has the ambition to address this by providing strategic input to FOOD 2030, the EC's FNS policy framework to better coordinate, connect, structure and scale-up R&I for future-proofing food systems to ensure Food and Nutrition Security.

To achieve our objectives, the number of countries participating in the SCAR FOOD SYSTEMS SWG should be enlarged and ideally should encompass all SCAR Member States. Priority will be given to attract more Member States, by identifying the factors for poor participation during the first FS SWG mandate and lessons learnt, by asking their support in the SCAR plenary, by addressing them directly and by co-constructing subtasks in the actions foreseen with potential new countries.

2.2 Planned activities

The group's output will underpin R&I policy development in the EU's member states and at the EU level in order to contribute to policy coherence in the research and R&I area on food systems. The section 'Activities' should be considered as a draft work plan serving as a guide or menu, which will be adapted according to the specific needs of the actively involved MS. It is planned that the specific work plan will be shared with SCAR plenary at the beginning of each year.

2.3 Expected results and output

The SCAR FOOD SYSTEMS SWG will give special attention in the work plan to the type of deliverables that are needed. We strive to maximize the impact of the deliverables by giving attention to timing, targeting, dissemination and communication.

2.4 Target groups

Expected target groups are:

i. *Groups which already participated in meetings during the first mandate and are still concerned regarding the defined actions, like*: Member States, Regions, the SCAR Plenary and SCAR SG/SW/CW groups, the EC: DG RTD and AGRI; FACCE-JPI; JPI HDHL and OCEANS; BIOEAST Food Systems WG; ERA-NET SUSFOOD2-Sustainable Food Production and consumption.

ii. *Groups which didn't yet participate however are of interest due to the selected actions for the new mandate. Those include:* FAO, OECD, WHO, IBF; JPI WATER, relevant ERA-NETs (e.g. ICT-AGRI-FOOD on ICT-enabled agri-food systems), relevant KICs (e.g. CLIMATE, HEALTH and FOOD), Research Infrastructures, ETPs, EJPs, Art 187, Public-Private Partnerships, PRIMA initiative, BLUEMED initiative, the Atlantic Ocean Research Alliance.

Remark: JRC IPTS-Sevilla Spain on prospective studies; this is relevant for the assessment of scenarios.

2.5 Risks and risk mitigation

Lack of resources and a relatively small group of Member States that are actively involved.
Risk of divergence from the initial work plan because of high pressure towards urgent policy matters.
Mitigation: investigate funding and engage in looking for new members.
Risk of overlapping targets, work and output between the SCAR FOOD SYSTEMS SWG and other SCAR SWGs and CWGs, respectively.

Note: the highly-supported actions within the first term of SACR FOOD SYSTEMS SWG are providing a sound basis for continuation and reduction of risks since also their proposals for actions are all included in a coherent manner.

3 WORK PLAN AND PLANNED ACTIVITIES, THEMATICS, DELIVERABLES.

3.1 Activities:

The detailed work plan will only cover **one year** but will include an outline of possible activities foreseen for the rest of the mandated period. The work plan will be updated annually. The following 6 actions have been detailed by SCAR FOOD SYSTEMS SWG members (see Annex 1 for detailed descriptions of the actions) and will be discussed at the kick-off meeting in terms of final priority, realistic work load and sharing of responsibilities between SCAR members. Thus, the SCAR FS SWG will focus only on 2 or 3 activities that will be selected during the kick-off meeting.

1. Understanding of the complexity of adaptive food systems and methodology for a systems approach. *(**A1**. Food Systems of the future)*
2. Monitoring and assessment of food systems actions and progress *(**A2**. Monitoring impact)*
3. Effective translation of science outputs to policy practice in the form of best practice guidelines and the usage of policy briefs ***(A3**. Translate Science into policy)*
4. Engagement of actors and especially consumers / citizens via different participatory schemes *(**A4.** Consumers and Food Systems)*
5. Efficiently using agro resources and reducing the high percentages of food waste today in food systems of tomorrow (***A5**. Food Systems waste management).*
6. Digitalisation and food systems, a cross-sector approach to get new insights from another domain and means to reach breakthrough innovations. ***(A.6** Digitalisation and Artificial Intelligence)*

3.2 Work plan 2019-2020 (*concept, depending on priority-setting of actions at the kick-off meeting*)**:**

- December 2019 - An official invitation plus agenda for the kick-off meeting to be held in February 2020, will be sent around to all SCAR Member States, in particular also to countries that has not been nominated a national representative to the actual SCAR FS SWG.
- February 2020 – at the kick off meeting:
    - discussion, modification and approval of the here presented ToR (with the 6 proposed actions) to formally start the new mandate.
    - identification of the priority actions (2 or 3 activities) and decision on the deliverables
    - meeting outcome - detailed work plan for the first year taking into account a coherent set of activities corresponding to the actions finally prioritized.
- Spring 2020 - Jointly organize with the European CSA project Fit4FOOD2030 a workshop on understanding of food systems and indicators (**A1 and A2**) (scheduled in Spring 2020 in agreement with WP4 of the CSA) (in preparation).
- Second half of 2020 - Elaborating on Action **1**, in particular on the methodology and scenario development (**A1**, see Annex 1). The SCAR FS SWG will familiarize with the methodology of scenario development during 1 full day workshop. This allows carrying out an assessment of already developed scenarios and to prioritize outcomes presented in a report.
- Second half of 2020 - Elaboration on Action **2**, in particular on the selection of appropriate indicators (first workshop, most likely concomitant with the one of A1) and carrying out first assessments with these indicators in the MS (workshop 2 in first half of 2021), (**A2**, see Annex 1).

- At the end of 2020, finalize a detailed work plan for 2021. The work plan should be adopted by the SCAR SG and should be continuously aligned to developments in the FNS policy framework FOOD 2030, the Updated Bioeconomy Strategy, the International Bioeconomy Forum, the joint activities of JPIs: HDHL, FACCE, OCEANS, WATER and relevant ERA-NET, the Bioeconomy SWG, the Agricultural Knowledge and Innovation Systems (AKIS), the CWGs on Animal Health and Animal Welfare and Sustainable Animal Production group, SUSFOOD2, ICT-AGRI-FOOD, PRIMA initiative, as well as new partnership options.

Actions: 3 workshops: 1 kick-off meeting, 1 joint workshop with Fit4FOOD2030 and potentially other European partners, 1 workshop for A1 and A2; 3 ordinary meetings

Deliverables: official invitation letter and agenda for kick-off, detailed work plan for first and second year, 1 scenario report (A1), 1 indicator report (A2), minutes of meetings and workshops. The work will be steered by the Chair of the FS SWG and by the task leaders of A1 and A2.

Risk: The largest risk is that no consensus will be reached, however, the working ambience during the first term of the SWG has been encouraging. Another risk is related to continuous absence of MS, especially those already absent during the first SWG mandate.

3.3 Work plan 2021-2022:

Main tasks (concept depends on the priority list of actions at the kick-off meeting and the discussion in year 1; the relevant workshops are mentioned but will in practice be grouped and partly replaced by video conferencing to reduce the environmental impact of travelling):

1. **A 1: Food systems of the future** - The further activities in **A1** are focused on providing input to a radical innovation agenda and the setting up of a guidance council, with also a sub-group consisting of young professionals. The specific activities are defined by the assessment of scenarios and the prioritized outcomes of the review of existing scenarios.
   Deliverable: to be detailed, depending on the outcomes of the A1 activities in 2020.
   Risk: Familiarizing with working with the scenario methodology and prioritizing options ask for more time. An option could be to involve the JRC IPTS highly trained in prospective studies.

2. **A2: Monitoring impact** - The remaining activities in **A2** are dealing with 'working with the indicators' including appropriate data management systems.
   Action: Expert meetings will be organized with trained people in data management and knowledge of (required) infrastructure.
   Deliverable: To be detailed with experts in data management.
   Risk: The differences in data management and infrastructure possibilities between MS is so large that common recommendations cannot be given.

3. **A3: Translate science into policy** - Provide a list of best practices in each country about effective translation of science inputs into policy making (**A3**); all MS involved in the preparation of sheets of best practices in their country.
   Actions:
   - End of June 2021 qualitative descriptions of best practices in all participating MS of the FS SWG. Ireland and Hungary serve as pilot and coordinating countries.
   - end of 2021, before SCAR plenary, organize a meeting with relevant stakeholders such as policy makers, knowledge centers, NGOs/CSO, business authorities to present the collection of best practices in the form of a guide
   - In 2022 policy briefs (**A3**) will be elaborated and discussed in a joint workshop. Findings within the different actions in the FS SWG will be translated into policy briefs and tested with policy makers (during 5 exchange meetings).

Deliverable: report and a set of policy briefs
Risk:

- This mapping of best practices will strongly depend on the commitment of all MS and the capacity among each member state to bring the requested information together.
- The potential miscommunication between scientists and policy makers; the invitation of a training expert in policy communication during a FS SWG meeting will then be foreseen.

4. **A4: Consumers and Food Systems**

Actions:

- Beginning of 2021 –held a preparatory meeting in order to organize workshops
- In 2021 and 2022, xxx participatory workshops with citizens and a number of FS SWG members will be held in five different MS in order to exchange about:
  (i) possible engagements of citizens in local and European Food Systems actions,
  (ii) appropriate communication means for consumers,
  (iii) requested insights in food and health themes especially also including the young generation.
- In 2022 – a final workshop at the end of this activity to discuss results and potential implications (**A4**).

Deliverables: 1 report summarizing experiences and providing recommendations.
Risk: The search for motivated citizens willing to participate at the workshops. If considered as too difficult, the task leaders of **A4** will contact EU project coordinators in which this task is running (like the CSA Fit4FOOD2030 City Labs or Policy Lab initiatives in different countries).

5. **A5: Food Systems waste management** –

- In 2020- further analysis of literature and best case descriptions on food waste. All MS members are asked to provide input from their countries, both in terms of cases, implications, policies, regulations, framework, and public-private partnership initiatives.
- At the end of 2020, the first results will be presented and discussed at an annual FS SWG meeting.
- In 2021, a first creative workshop will be organized in which new activities to reduce waste and valorize better co-products will be explored, taking into account hurdles, different frameworks, opportunities and lessons learnt. These activities are then discussed and tested in MS, including policy makers (link with A3), citizens (link with A4).
- In 2022, insights will be shared and a policy option document will be prepared in a workshop with policy makers.

Deliverables:

- 1 review report with best cases and country specific policies,
- 1 report summarizing experiences and providing recommendations.

Risk: The difficulties to come up with radical, new, creative ideas for tackling this vast and highly complicated issue in the society.

6. **A6: Digitalisation (DG) and Artificial intelligence (AI)**

- in 2020 - identify best practices concerning capability and technologies, which support realizing DG/AI within food systems (FS) and other interconnected systems. Here, cooperation with the ERA-NET ICT AgriFood is foreseen due to their expertise in this area.
- At the end of 2020, the first results will also be presented and discussed at the annual FS SWG meeting.
- In the first half of 2021, the focus will be on indicators against the DG / AI criteria

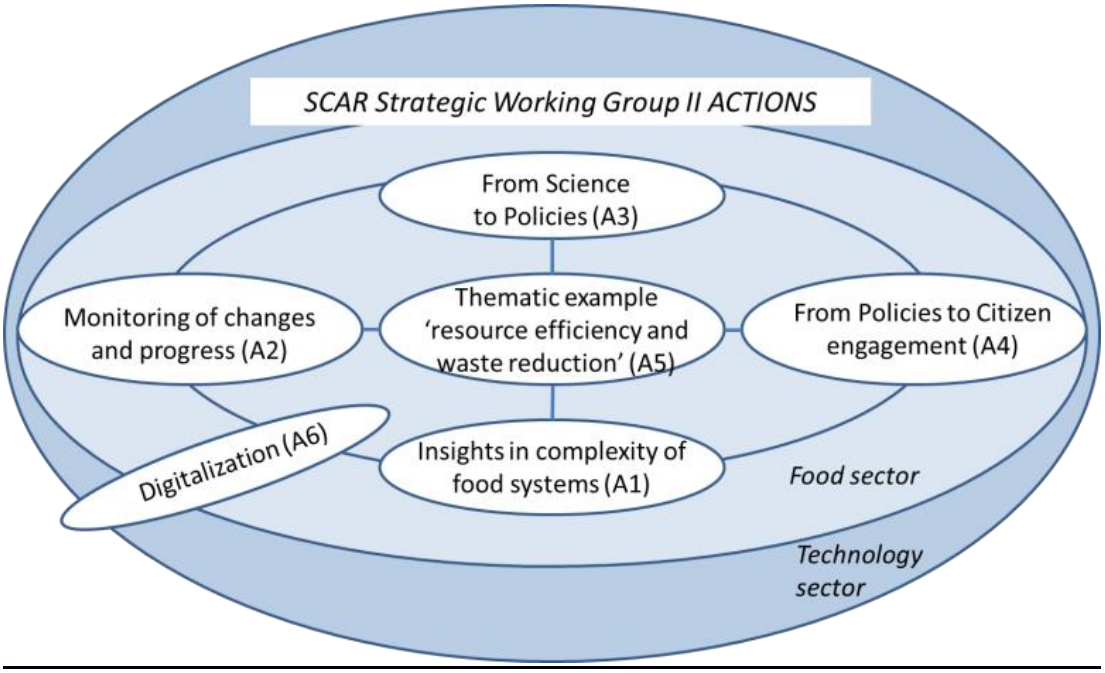
- In the second half of 2021 the focus will be on scenarios (see Annex 1)=> organise a workshop to provide a set of DG/AI scenarios driving sustainable future food systems
- In 2022, insights will be translated into propositions for research and innovation actions and policy briefs on "Risk and benefits" when introducing DG/AI and DG/AI impact.

Deliverables:

- 1 review report with the utility of indicators and technologies for DG/AI against the goals
- 2 policy briefs on "Risk and benefits" when introducing DG/AI and DG/AI impact.

Risk: The willingness of experts in DG/AI – with sufficient knowledge of food systems to provide input to the reports and workshop.

Proposed cross-cutting Actions to be adjusted and prioritized in the workshop at the beginning of 2020 ;



ANNEX

Action 1: Food systems of the future

Objectives:

- Overview of current scenarios for sustainable food systems in 2030-40-50 (Images of future food systems) and critical assessments
- Monitoring current R&I programs in view of scenarios (observatorium and appropriate indicators
- Proposing alternative program options based on understanding of the complexity of the European food system and its regional/territorial sub-systems
- Translating new insights into Research and Innovation actions
- Monitoring and guiding these actions to review scenarios and actions
- Aligning actions with the SCAR Foresight group.

Content:

Climate change and over-exploitation of resources will continue to put high challenges on food systems and, hence, their sustainability. The same holds for alarming figures for food security, obesity, desertification, clean water, etc. This has led to new research and innovations activities. However, in Europe we haven't yet commonly defined potential images of our future neither developed a set of scenarios that could help in prioritizing options to act. We are at the beginning of a transition from linear chain thinking and acting – that has brought us mass consumption – towards system approaches that should lead to balanced sustainable consumption and production. This requires understanding of the complexity of food systems and its sub-systems in Europe. Which developments shows chaotic behavior and which result in highly rigid outcomes? Where are evolutions more balanced and self-organized, adaptive to changes, resilient to extreme conditions, and showing emerging food system properties according to our expectations and images of the future? How are stakeholders (including consumers) interacting in such balanced systems? What are the consequences of their actions on the dynamics of the system (radical changes or optimized solutions)? What does diversity – the key concept underlying agroecology thinking – mean in food systems in terms of products, players involved, (food) culture, food environment, etc.? What are relevant and effective leverage points for targeted changes with options for creating synergies among desirable outcomes. European data on SDGs achievements represents a first statistical dataset that can support prioritizations of actions and foreseen scenarios (for example the following reference: EUROSTAT 2019, Sustainable Development Goals – Overview: https://ec.europa.eu/eurostat/web/sdi). What will be the consequences of different types of dietary changes for the combined outcomes in terms of e.g. health, climate/environmental impacts as well as cultural values, animal welfare and social costs.

Deliverables

1. A review of existing/ongoing Scenario and foresight studies of options for sustainable food systems in 2030-40-50
2. A critical assessment of approaches and outcomes;
3. Knowledge of the complexity of food systems a, a conceptual frame and one (more) models;
4. An innovation agenda for radical innovations and optimization steps (input from 1,2 and 3);
5. The specification of a guiding committee, with experts and young professionals/scientists.

Sustainable Development Goals addressed:

The following Strategic Development Goals are integrally addressed: **SDG2**: zero hunger, **SDG6**: clean water and sanitation, **SDG7**: affordable and clean energy, **SDG8:** decent work and economic growth, **SDG9:** industry, innovation and infrastructure, **SDG11:** sustainable cities and communities, **SDG12**: responsible consumption and production, **SDG13:** climate change, **SDG14:** life below water, **SDG15:** Life on land, and **SDG 17:** partnerships for the goals.

Action 2. Monitoring impact

Objectives

SCAR FS SWG aims to provide strategic advice and support that has a measurable, practical, communicable and direct impact on food systems policy and practice. The ability to measure and monitor success is therefore critical to demonstrating good practice and evaluating research and policy outcomes.

The objectives of this work strand are to:

1. Identify indicators that can be used to measure progress against the FOOD2030 priorities and four key areas.
2. Evaluate indicators against a range of criteria in order to provide a recommendation on which indicators are most useful for monitoring food systems.
3. Set out the risks and potential future opportunities for measuring and monitoring impact.

Content

A large range of indicators already exist which can be used to monitor food systems, which include the SUSFANS Toolbox (https://www.susfans.eu/), recommendations from academic literature (e.g. Chaudhary et al, 2018), and numerous national level indicators. This work strand aims to map indicators that can monitor progress against the four FOOD2030 goals: nutrition for sustainable diets, climate smart food systems, circularity, and innovation.

Indicators should be assessed against a range of considerations, including:

- The utility of indicators for monitoring progress against goals
- Targets and existing baselines associated with each indicator
- The commonality of indicators across member states
- The time-scale of indicators (short-, medium-, and long-term)
- The data and infrastructure available to support indicators incl. possible data needs

The key actors responsible for indicators (e.g. EU, National, public sector, private data), risks and potential opportunities, for example around data use and access, should be highlighted as part of the evaluation exercise. Particular consideration should be given to how indicators can be applied: how they will be used to assess impact and progress towards goals, evaluate good practice, and inform future policy.

Deliverables

The output of this work strand will be a recommendation for a set of approximately five to ten holistic indicators that measure progress towards the FOOD2030 goals.

Sustainable Development Goals addressed:

The work strand contributes to the following sustainable development goals:
SDG2: Zero Hunger; **SDG3:** Good health and wellbeing; **SDG9:** Industry, innovation and infrastructure; **SDG11:** sustainable cities and communities; **SDG12:** responsible consumption and production; **SDG13:** climate action; **SDG14:** life below water; **SDG15**: life on land; **SDG17:** partnership for the goal.

Action 3: Translate science into policy

Objectives

1) Explore, within MS, the links between government ministries (departments) and independent research bodies (e.g. research centers and universities) where research outcomes are considered as part of policy formation.
2) Evaluate and identify examples within MS of existing policies where scientific/research outcomes have influenced policy, focusing on the key contributing and hindering elements in the translation of science into policy.
3) Identify the key requirements e.g. training, funding, and the strategic areas along the system from science to policy, where such key resources would benefit.
4) Establish a set of best practice principles that enables effective translation of science/research outputs for future policy.

Content

The Food2030 framework sets out to provide evidence for polices and solutions (knowledge, methods, technologies, services, business models, etc) addressing the 4 priorities of nutrition for sustainable diets, climate smart food systems, circularity, and innovation. Generally accepted evidences are produced in scientific research and published in the form of scientific papers. Such evidences are available in an overwhelming amount and in a great variety as regards scope, aims and quality. Therefore, in many respects policy should define research needs. Strategic funding of R & I with the end user in mind should enable outputs that can have practical application and impact.

Much progress has been made in the support of food systems R & I, with an estimate of €5 billion from successive FP's spent or allocated across the whole food chain between 1988 and 2020 and nearly €80 billon of Horizon2020 (2014-2020) funding becoming available to all research domains. Furthermore, significant national R & I resources are also allocated in the MS's. According to the quantitative mapping study of the SCAR Food Systems SWG it ranges between 9 and 907 million Euro per Member State. However, it is not apparent if the results/outcomes are successfully communicated and/or suitable for communication to policymakers for translation into practice. It is acknowledged that capturing and monitoring a measurable impact of scientific outcomes of FOOD2030 is a challenge, which is why it is a proposed separate action (see Action 2) for the next ToR. Complex disseminated outputs by researchers and lack the ability to understand such science by the policymaker and/end user are just examples of the type of roadblocks in successfully translating scientific outputs into policy, practice and impacting innovation. Areas of where and how science has been effectively translated into policy and further implemented into practice should be examined, with specific focus in areas within the food systems scope. Action 1 will be mainly carried out independently, however where possible will avail of opportunities to align and collaborate with other actions (i.e. Action 1: Food systems of the future and Action 5 Food waste management) in cross-cutting activates (e.g. workshop with FIT4FOOD2030).

Deliverables

1. Set of best practice guidelines in effective translation of science/research outputs to policy-practice using MS examples.
2. Policy recommendation in the form of a policy brief encapsulating measures identified that can effectively translate science into policy.

Sustainable Development Goals Addressed

SDG2: Zero Hunger; **SDG3**: Good health and wellbeing; **SDG:6** Clean water and sanitation; SDG9 Industry, innovation and infrastructure; **SDG11:** Sustainable cities and communities; **SDG12:** Responsible consumption and production; **SDG13:** Climate action; **SDG 14**: Life below water; **SDG15:** Life on land; SDG17: Partnership for the goal.

Action 4: Consumers and Food Systems

Objectives

- To better understand the role of consumers in all components of Food Systems.
- To improve the understanding of the potential role of citizens and consumers within a Food Systems approach as main actors and decision makers and which leverage points could be addressed to enhance positive dietary choices and outcomes.
- To provide input to SCAR/EC research agendas and Missions on knowledge needs for strengthening food systems approaches and successfully identifying leverage points for synergistic improvements in food systems outcomes.
- To critically assess how and to which extent citizens may be empowered in different existing approaches towards citizen centered Food Systems.

Content

Across the world, participatory approaches are emerging through the food system, driven by crowd-funding and sourcing, by open innovation and open policymaking, and most importantly by the energy of citizens.

This is a shift in mindset, reframing the task of creating a better food system, which engages citizens and consumers in co-innovation and development and in finding leverage points for enhancing food system change. Hereby, the overall aim remains at creating synergies between improved human nutrition for health and well-being and the needs for a sustainable agri-food system with low environmental and climate impact, maintenance of eco-systems services in a circular bio-economy.

Thus, this starts with a single word: Citizen. It is important that more citizens understand that food is part of what makes them whole persons and act consciously in their choice and composition of diets. We need to understand better how citizens appraise food and whole diets and which information is necessary and relevant for consumer segments to become more engaged in understanding the origin and consequences of food choices in a dietary perspective including health, climate/environmental impacts as well as cultural values, animal welfare and social costs.

Global challenge of sustainable food consumption and production is against the backdrop of low consumer awareness of sustainable food options and the lack of internationally acknowledged appraisals on how to produce and efficiently convey credible sustainability product information to consumers. Moreover, it is questionable to what extent such information in itself is conducive to changing behavior and which other conditions are necessary for this, from nudging to co-innovation and engagement in localized food systems. The so-called *food environment,* denoting the conditions and situations of food purchases including marketing and availability/placement of food items in stores or at markets, plays a significant but under-researched role in influencing the consumption patterns and thus the above-mentioned consequences of diets. Thus, influencing and redesigning food environments might be a leverage point for positive and synergistic changes.

A number of international initiatives are aiming at improving the dietary related personal and societal consequences using different approaches under a food systems paradigm. From FAO/WHO sustainable food systems program to EC FOOD2030 initiatives to EIT Food's ambition of creating a citizen centered food system and many more regional and local initiatives the basic assumption is that empowering consumers as conscious citizens would create positive changes for people's health as well as supporting sustainable and climate smart agriculture etc. In spite of the many initiatives building on the idea of an integrated "Food system", critical assessments of such approaches and the overall paradigm is lacking and from a practical and scientific perspective, there are challenges in grasping complexity, interdependencies and feedback loops, pointing to efficient leverage points and in precisely defining the borders of specific (innovative) food systems to assess them.

The five fundamental principles establish minimum requirements that must be met when providing product sustainability information to consumers are Reliability, Relevance, Clarity, Transparency and Accessibility.

Main challenges to face are the following:

- Review existing large scale and – selection of – regional scale sustainable food systems initiatives

- Critically assess results and impact in terms of e.g. health, climate/environmental impacts as well as cultural values, animal welfare and social costs.)
- Review and critically assess different definitions and approaches on how to reach the "Healthy and sustainable" diet choice and its affordability for all consumers,
- Review and critically assess different definitions and approaches to developing so-called Personalized nutrition and its potential affordability for all citizens,
- Review and critically assess different approaches used in international and regional initiatives aiming at improving the consumers' consideration and weighting of consequences of their food choices including the effects of improving consumers' education by new information channels and social media, and with special attention to younger generations.
- How to better understand consumers' choice, attitude, behavior and awareness – How to improve assessment and understanding?
- Review and critically assess different approaches building on the potential for directing Public procurement of food for large scale kitchens towards synergies in health and sustainable food provisioning.

Deliverables

1. A review of existing large scale and – selection of – regional scale sustainable food systems initiatives with co-assessment of results and impact in terms of e.g. health, climate/environmental impacts as well as cultural values, animal welfare and social costs.
2. Increasing the understanding of the potential role of citizens and consumers in the Food Systems as main actors and decision makers and provide a list of leverage points that could be addressed to enhance such behavior (study report).
3. Input to a research agenda aiming at knowledge needs for strengthening food systems approaches and successfully identifying leverage points for synergistic improvements in food systems outcomes
4. Input to relevant Horizon Europe missions and advisory boards
5. Gathering National and European measures and initiatives contributing to empower the citizen and consumer across the food systems.
6. Communicating and disseminating these initiatives across Europe in order to improve awareness capacity building and cross fertilization to increase European citizen and consumer empowerment through the food systems.

Sustainable Development Goals Addressed

SDG2: Zero Hunger; **SDG3:** Good health and wellbeing; **SDG12:** Responsible consumption and production.

Action 5: Food system waste management

Objectives:

Food loss and waste must be avoided to a large extent in order to future proof our food systems. Many actions have been undertaken during the last years on all levels (International/European/National; policy/research), e.g. EU Platform on Food Losses and Food Waste, H2020 projects like FUSIONS and REFRESH, various H2020 projects, DG SANTE etc.). Therefore, the objective for the SCAR FS group will be to add value to the existing initiatives while putting emphasis on a systems approach and knowledge sharing:

- Connect stakeholders at all levels
- Create a space for mutual learning and knowledge sharing among MS, involving especially those who are not yet largely involved
- Collecting mapping results
- Raise policy interest to food waste

Content:

The reduction of food waste represents, from an ethical, ecological and economic point of view, a challenge for all concerned: for politics, for economic operators, consumers, science and civil society. More than 800 million people worldwide are starving, more than twice as many are malnourished or undernourished. The production of food demands valuable resources such as soil, water, energy and fuel and is associated with emissions of greenhouse gases, therefore food should not be unnecessarily get lost or wasted. In the EU alone, around 88 million tons of food waste are generated annually with implications not only on economies, but also on our environment and on our societies. Preventing and reducing food waste in the long term will contribute to food security, reduced pressure on land and water, Climate change mitigation, reduced food poverty and improved social innovation. However, it is a system challenge, and all actors will need to be involved. The European Commission takes the problem very seriously and seeks in cooperation with Member States and stakeholders for ways to reduce food waste and design more sustainable food systems. The following guiding questions should be considered by the SCAR FS SWG:

What do we know?

- where does food loss and waste occur, what are the quantities and types of waste;
- what are the effects on the environment, economy and society;
- which prevention measures (or recycling) are efficient?

How do we act and how to change?

- Political framework, regulations (e.g. legislative obstacles or incentives, trade-offs, externalization of costs etc.)
- Industrial processes and emerging markets (e.g. circularity, use of side-streams, zero-waste systems, full recovery or full recycling, packaging, sustainable materials, overlaps and synergies with non-food sectors etc.)
- Behavior of all actors (e.g. cultural aspects, habits, awareness campaigns, citizen movements, training and education of all actors etc.)
- Role of R&I (e.g. effect of industrial processes, such as circularity, full recovery and full recycling on human, animal and plant health as well as on the environment).

Deliverables

1. Overview of the undertaken (research) activities so far, elucidating success factors as well as gaps on the way to prevent food loss and waste on a systems level.
2. Mutual learning among MS and sharing knowledge and best practices (workshops) especially with the EU Platform on Food Losses and Food Waste.
3. Recommendations to strengthen a systems approach regarding the reduction of food loss and waste

Sustainable Development Goals addressed:

SDG1: No Poverty; **SDG2:** Zero Hunger; **SDG3:** Good Health and Well-being; **SDG6:** Clean Water and Sanitation; **SDG9:** Industry, Innovation and Infrastructure; **SDG11:** Sustainable Cities and Communities; **SDG12:** Responsible Consumption and Production→**12.3** Reduce food loss and waste; **SDG13**: Climate Action; **SDG14:** Life Below Water; **SDG15:** Life on Land; **SDG17:** Partnerships to achieve the SDGs

Action 6: Digitalization (DG) and Artificial intelligence (AI)

Aims: To provide strategic advice in creation of trust zones and effective communication within Food systems and interconnected Systems via DG / AI measures in the light of rapid societal challengers

Objectives:

- Identify best practices capability and technologies, which support realizing DG/AI within food systems (FS) and other interconnected Systems.
- Evaluate and monitor indicators against the DG / AI criteria that drives the DG/AI process within FS and other interconnected systems.
- Scenarios for FS and other interconnected Systems digitalization / AI.
- Translating new insights into research and innovation actions.
- Set out the risks and potential future opportunities for DG/AI within FS and other interconnected systems.

Content

Digitalization presents many types of challenges and opportunities, an example is the introduction and integration of new technologies in order to improve quality, efficiency and competitiveness. Digital technologies are helping every industry on earth eliminate waste, engage in better forecasting and improve how they remain accountable to their customers and shareholders. This challenge becomes even more important for the FS, which is considered one of the most important sector of the current economy. Indeed, it is especially in this segment that is clear an increasing level of variability in terms of demand, volume, process, manufacturing technology, ever-changing health and safety requirements, customer behaviour and supplier attitude. So the FS is facing peculiar global challenges that can be met with support by digital technologies and where the new paradigm of Industry 4.0 can represent an interesting evolution.

The digitalization in the food sector started to gain relevance only during the last several years. It seems that this topic is still new and more research needs to be conducted together with the ERA-NET AgriFood. Internal and external factors, which drive the implementation of digitalization process in FS, need to be identified. A systematic approach/framework for the digitalization process in FS need to be developed, best practices and enabling technologies need to be discussed, the applicability of technological solutions for the specific FS issues need to be tested and validated. It is evident that this area still requires significant investigations, the systematic approach/framework developed could help and guide food industry to the digitalization process.

Deliverables

1. The utility of indicators and technologies for DG/AI against the goals.
2. A set of DG/AI scenarios driving sustainable future FS.
3. Policy briefs on "Risk and benefits" when introducing DG/AI and DG/AI impact.

Sustainable Development Goals addressed:
The following strategic development Goals are integrally addressed: **SDG2**: Zero Hunger, **SDG 3**: Good Health and Well-being, **SDG 4:** Quality Education, **SDG6:** Clean Water and Sanitation, **SDG 8**: Decent Work and Economic Growth, **SDG9**: Industry, Innovation and Infrastructure, **SDG 11**: Sustainable Cities and Communities, **SDG 12**: Responsible Consumption and Production, **SDG 13:** Climate Action, **SDG 14**: Life Below Water, **SDG 15:** Life on Land, **SDG 17**: Partnerships to achieve the Goal

List of abbreviations:

AGRI: DG Agriculture and Rural Development

AKIS = Agriculture Knowledge and Innovation Systems

BSW = Bioeconomy Strategic Working Group

CSA = Coordination and support action

EIP = European Innovation Partnership

ERA = European Research Area

EU = European Union

FACCE = Food Agriculture and Climate ChangE

FAO = Food and Agriculture Organization of the United Nations

HDHL = A Healthy Diet for A Healthy Life

IBF = International Bioeconomy Forum

JPI = Joint Programming Initiative

KIC: Knowledge and Innovation Communities

MS = Member States

OECD = The Organisation for Economic Co-operation and Development

PRIMA = Partnership for Research and Innovation in the Mediterranean Area

SANTE = DG Health and Food Safety

SCAR = Standing Committee on Agricultural Research

SWG = Strategic Working Group

SUSFOOD = Sustainable FOOD production and consumption

ToR = Terms of Reference

UN: United Nations