

TRANSLATING THE GREEN DEAL INTO PRACTICE

Research and innovation opportunities for sustainable food systems



MAIN CHALLENGES FOR FOOD SYSTEMS

CLIMATE CHANGE
BIODIVERSITY LOSS
CONSUMER COMPETENCE
MALNUTRITION

BACKGROUND

The European Green Deal¹ and the Farm to Fork² strategy therein, announced by the European Commission, aim to transform the agri-food sector and arrive at a carbon-neutral, circular, resilient, and resource-efficient food system, restoring biodiversity and promoting sustainable and healthy diets to citizens. Such a transition will heavily affect the EU, as the agri-food sector provides the highest number of jobs in Europe³. To progress on these goals, research and innovation (R&I) is needed to minimise unfavourable trade-offs and to develop, implement and scale-up workable solutions. The Green Deal offers the opportunity for companies to take the lead in the transition to more sustainable practices which - with the right support - can lead to a thriving bioeconomy within planetary boundaries. By well-chosen R&I investments, Horizon Europe can contribute to making these opportunities come true.

CONCEPT

The European Technology Platforms (ETPs) 'Plants for the Future', 'Food for Life' and TP 'Organics' have jointly developed R&I policy recommendations to address several of the most pressing challenges for food systems. The recommendations focus on primary production and consumption. They are the outcome of a dedicated expert workshop⁴ to discuss priorities common to the three ETPs. This executive summary will be followed by a more exhaustive report.

¹ European Commission (2019). The European Green Deal.

² European Commission (2020). The Farm to Fork strategy.

³ FoodDrinkEurope (2019). Data and Trends report.

⁴ The Workshop took place on 2-3 March 2020, gathering 18 experts from the three ETPs.

Challenges in sustainable food systems



Climate change

Agriculture and food production are both a main cause and victim of climate change. Farmers are increasingly suffering from the effects of climate change in terms of global warming and weathervolatility. The rise in temperature is increasing the migration of pests and disease from south to north, while heat waves and irregularities in water supply have become frequent in Southern Europe and have also started to occur in Northern Europe. To secure sustainable production of crops and livestock the agri-food sector needs to invest in R&I to both adapt to and mitigate the effects of climate change.

Biodiversity loss

Agriculture, through land use change and practices, is a main contributor to biodiversity loss. Failure to act now will cause further losses of agricultural biodiversity and natural biodiversity. This will negatively impact the overall ecosystem, as well as society, when it comes to food diversity, choice, affordability and a healthy environment. All actors in the food system and especially farmers need to be enabled to adopt more diverse crops and agroecological practices to maintain the natural balance of ecosystems and to produce in a sustainable fashion. A special focus on below-ground biodiversity is needed, since soils are key to maintaining the resilience of agriculture production.

Challenges in sustainable food systems

Consumer competence

Consumer choice is a primary driver for demand at farm and industry level and shifts in consumer choice bring change in the entire food system. However, effective market incentives for healthy and sustainable individual food choices are currently missing. To reduce the environmental impact of food production, diets should be promoted that are composed of diverse, healthy, nutritious and sustainably produced ingredients and that ensure culturally accepted, joyful, consumption. To achieve this, consumers should be aware and trustful of the overall food system and its co-benefits, supported by a holistic regulatory framework.

Malnutrition

Food plays a central role when health is considered as a state of physical, mental and social well-being. A consumption lifestyle driven by unhealthy diets is at the basis of malnutrition. Malnutrition relates to a lack or overconsumption of calories in a diet and to an inadequate consumption of essential nutrients. It ultimately contributes to the rise in non-communicable diseases. To fight malnutrition, better consumer knowledge and more diverse and healthy diets need to be developed to successfully promote a shift towards a healthy diet and lifestyle.



R&I RECOMMENDATION 1



An environmental performance toolbox

To adapt to climate change and to maintain, or even to improve, crop yield and quality, farmers need access to state-of-the-art tools and knowledge regarding available crop varieties and livestock breeds, including their performance in various environmental conditions. R&I is needed **to catalogue and improve crop and livestock**

performance by testing, across the EU, the effects of diverse combinations of livestock and crops with diverse and mixed cropping systems. This should be done on a **multi-year, multi-cropping scale**, in combination with **sustainable and mixed agricultural practices**, and should include information regarding farm outputs, such as carbon sequestration, landscape maintenance and/or rehabilitation, and biodiversity.

These data would need to be brought together into an **environmental performance toolbox** and be made accessible to farmers and other stakeholders such as breeders, advisors, food business operators, retailers, policy makers and researchers.

Farmers could select from the toolbox the optimal combination of crop varieties, livestock breeds and agricultural practices to fit their conditions and needs in the most sustainable way possible. It is anticipated that **decision support systems** will be needed to enable the best use of the toolbox, and that switching to more sustainable practices will require financial support to mitigate business risks. The environmental toolbox is expected to optimise farm productivity and contribute to climate change adaptation and mitigation by promoting a wider use of more environmentally friendly crop varieties and livestock breeds and management thereof, and of appropriate processing practices.

Smartly *reducing* *pesticide use*

For many farmers pesticides are currently essential to maintain crop yield and quality and to profitably operate the farm. At the same time, pesticides can have a negative impact on biodiversity, on the ecosystem and on human health. There is therefore a push to reduce the use and risk of pesticides. R&I is needed to **1) investigate pest and disease resistance in plant genetic resources** and how to accelerate genetic resistance using breeding techniques; **2) improve and broaden farm management practices**, such as crop rotation, intercropping, tillage, use of functional biodiversity, biological control, use of natural predators, use of the microbiome, pre-treatment of seeds and precision farming; **3) develop and optimise new digital monitoring technologies**, such as disease/pest detection sensors to enable preventive measures; and **4) identify and develop environmentally friendly pesticides**. To successfully reduce the use of pesticides it will be critical to consider the specific needs of the different sectors, e.g. arable crops or horticulture. Experimental real-life labs and demo-farms need to be set up to demonstrate feasibility and to provide training to farmers. For the highest impact, solutions will need to be tailored to the needs of individual regions/farms.

R&I RECOMMENDATION

2



R&I RECOMMENDATION 3



Improving consumer knowledge and choice regarding healthy and sustainable diets

The purpose of increasing the competence of consumers regarding healthy and sustainable diets is to enable an increased demand for diets meeting such criteria. Such demand would create a market pull enabling value chain players to respond and to set up tailored production channels

across the food system. R&I is needed to **1) understand the drivers and barriers for consumer choice associated to healthy, diverse and sustainable diets, and 2) determine how to promote best consumer education and awareness on the foregoing.** Many options exist (e.g. school education, social media, focus groups) and the best practices will vary depending on, for example, criteria such as age, ethnicity, and financial means. Information should be tailored as much as possible to the target groups. R&I is furthermore needed to **3) install harmonised and effective communication with citizens and consumers across Member States,** including labelling, advertising and food products co-creation. For this, R&I is needed to **4) advance traceability and transparency regarding the sustainability and health impact of food products throughout the value chain.** Short food supply chains offer here an excellent entry point to connect consumers with producers, thereby increasing consumers' food competence, while increasing transparency of the value chain. This R&I action should be supported by a timely harmonisation of standards and of Member State policies regarding healthy diets, to promote a concerted multi-actor value chain approach, addressing a growing consumer preference for healthy and sustainably produced food.

Diversified farming systems for diverse diets

A broad dietary diversity is a cornerstone of a healthy lifestyle in which disease is prevented rather than cured. The taste, nutritious value, health, sustainability and diversity of diets is to a great extent determined early in the production value chain at the farm, by the choice of crops and livestock, and the associated farming practices. By broadening the diversity at the farm level, the variety of healthy, sustainable diets offered to consumers can be extended and tailored, and thereby lead to higher adoption. R&I recommendations include **1) exploring and improving alternative protein sources**, including plant-based protein; **2) improving livestock breeding and management** (including feed characteristics) for mixed farming systems with a lower environmental impact; **3) developing new varieties of existing crops, reintroducing and domesticating niche and heirloom crops, and developing and introducing new or underutilised crops**; and **4) developing and scaling up new crop rotations and new intercropping**

R&I RECOMMENDATION 4



techniques, to diversify the number and types of crops grown on one farm or in one region. Promoting diverse crops and livestock with a variety of farming systems for diverse diets, human health and resilient production is a joint responsibility of policy makers and actors in many areas: agriculture, health, education, environment and R&I services. A multi-actor approach is needed to avoid fragmentation and develop a resilient food system built on diet diversity.

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The European Technology Platform (ETP) ‘Food For Life’ is an industry-led stakeholder forum aimed at stimulating innovations for the European food

industry to the benefit of a sustainable society. ETPs develop research and innovation agendas and roadmaps for action at EU and national level to be supported by both private and public funding. They mobilise stakeholders to deliver on agreed priorities, share information across the EU and help deliver solutions to major challenges of key concern to citizens. Find out more on <http://etp.fooddrinkeurope.eu/>.

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TP ‘Organics’ is the European Technology Platform for Organic Food and Farming. Its mission is to strengthen research & innovation for organic and other agroecological approaches and so contribute to sustainable food and farming systems. TP ‘Organics’ identifies research needs and then relays these to policy-makers in Europe and beyond. TP ‘Organics’ also builds capacity for the organic movement by providing information on funding opportunities and promoting knowledge exchange between farmers, companies, and researchers. Learn more on <https://tporganics.eu/>.

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The European Technology Platform (ETP) ‘Plants for the Future’ is a stakeholder

platform representing the plant sector. ETP ‘Plants for the Future’ integrates industry, farmers and academia interests to promote the flow of innovation to the market and is committed to supporting education, research and innovation towards more sustainable agriculture. Learn more on <http://www.plantetp.org/>.

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