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Discussion Paper
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Discussion Paper

The Spanish Presidency of the EU wishes to highlight the key role that technologies will play in the agri-food sector to promote the transition towards a more sustainable and productive model, adapted to meet the challenge of climate change. The promotion of new technologies will help the EU to remain at the forefront in all areas of technology and innovation linked to the agri-food sector, including new genomic techniques.

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NEW TECHNOLOGIES FOR A MORE SUSTAINABLE AND RESILIENT AGRICULTURE

1. Sustainable food systems facing the challenge of climate change.

Agriculture and the supply of safe, nutritious and sufficient food is a global challenge on our planet, which, according to UN forecasts, will reach 9.7 billion people by 2050. The achievement of this challenge is being seriously threatened. Thus, the latest report on "The State of Food Security and Nutrition in the World"[1] by the FAO shows that there has been a setback in efforts to eradicate hunger and malnutrition. The global number of people suffering from hunger increased to 828 million people in 2021, an increase of about 46 million since 2020 and 150 million since the coronavirus disease pandemic outbreak (COVID-19), a situation that has been exacerbated by the consequences of Russia's illegal invasion of Ukraine.

In the aforementioned report, the FAO highlights the fact that the intensification of the main contributing factors to increasing food insecurity and malnutrition (i.e., conflict, extreme weather events and economic shocks), along with growing inequalities and the high cost of food, will continue to hinder the achievement of the goal of eradicating hunger and malnutrition by the end of this decade. Transformation towards sustainable agri-food systems will be a key element in achieving this goal.

The Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC)[2], describes in detail the severe effects of increasing greenhouse gas (GHG) emissions, but at the same time is hopeful by identifying actions that can be implemented, and in some cases cost-effectively, reduce GHG emissions, increase CO_2 sequestration and thus enhance the resilience of systems, including food systems. Short-term

[1] FAO. 2022. The State of Food Security and Nutrition in the World 2022. Repurposing food and agricultural policies to make healthy diets more affordable. https://www.fao.org/documents/card/en/c/CC0639EN

[2] IPCC, 2023: Summary for Policymakers. IPCC, Geneva, Switzerland, 36 pages. https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

integrated climate action is urgently needed to secure a liveable and sustainable future. There is a window of opportunity for such action, but it will close soon.

Climate action must be framed in the context of the United Nations-led action to transform food systems so that they can decisively contribute to feeding the planet's growing population sustainably, while preserving the climate and biodiversity, and allowing rural communities to continue to make agriculture a profitable and future-oriented activity.

2. Innovation and technology are key enablers in food systems transformation.

FAO identifies four key drivers of food systems transformation: improved governance, increased consumer awareness, improved income and wealth distribution, and mainstreaming of technological, social and institutional innovations.

This crucial role of innovation in the European agri-food sector is fully present in the "Farm to Fork" Strategy[3]. This Strategy recognises that the way forward will come from technological, digital and nature-based solutions by highlighting how "Research and innovation (R&I) are key drivers in accelerating the transition to sustainable, healthy and inclusive food systems, from primary production to consumption".

The Joint Research Centre's recent outlook report 2022: "Towards a Green and Digital Future"[4] has analysed how green transition and digital transition in the European Union can be mutually reinforcing, with digital technologies acting as a catalyst. To this end, the report analyses the factors that would enable the deployment of technologies that would support the green transition to be scaled up, considering social, technological, environmental, economic and political factors. In the scope of agriculture, many technological innovations can contribute to environmental transition, including smart agriculture, sensors, feed additives, carbon sequestration, nitrogen-fixing crops, digital twins, artificial intelligence-based plant disease recognition and gene editing.

[3] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system. https://eur-lex.europa.eu/resource.html?uri=cellar:ea0f9f73-9ab2-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF

[4] Muench, S., Stoermer, E., Jensen, K., Asikainen, T., Salvi, M. and Scapolo, F., Towards a green and digital future, EUR 31075 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-52452-6, doi:10.2760/54, JRC129319. https://publications.jrc.ec.europa.eu/repository/handle/JRC129319

Research on new perennial grains and new nitrogen-fixing cereal varieties is also promising for ecological transition. Improving irrigation practices requires monitoring and forecasting tools, as well as smart control systems for water management. In livestock farming, digital tools will enable monitoring of animal health, helping to reduce the use of veterinary drugs and will allow the identification of genetic profiles for breeding. The Agricultural Knowledge and Innovation Systems (AKIS) will also help farmers to acquire the knowledge to implement farming practices that will allow them to increase carbon sequestration in the soil.

3. Innovation in plant breeding will accelerate the development of more resilient varieties and thus help to strengthen agriculture's climate transition.

Biological evolution, through natural selection, has made it possible to achieve a genetic variability that is key to the necessary adaptation and evolution of living beings to a changing environment. Humans have used this genetic variability since the beginning of the domestication of animals and plants, selecting those organisms with the most desirable traits. This is the basis of plant breeding, a discipline that has evolved in parallel to the generation of new scientific and technological knowledge.

The present and future of breeding are linked to scientific and technological progress, such as gene-editing technologies, which represent a clear advance regarding efficiency, precision and versatility, while aiming to reduce costs and ensure greater universal access to benefits.

We are at a key moment in the European Union, with different regulatory initiatives underway, which have at their core sustainability and the need to respond to the threat posed by climate change. One of these initiatives is precisely the one concerning the regulation of the use in European agriculture of materials obtained through new genomic techniques (NGTs), presented on 5 July[5].

In presenting the proposed Regulation, the Commission has indicated how NGTs can contribute to the transition towards a more sustainable food and agriculture system and help reduce the EU's external dependencies for agri-food production.

[5] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on plants obtained by certain new genomic techniques and their food and feed, and amending Regulation (EU) 2017/625. https://food.ec.europa.eu/document/download/c03805a6-4dcc-42ce-959c-e4d609010fa3_en?filename=gmo_biotech_ngt_proposal.pdf

As the Commission itself states, these plants will help address new challenges posed by climate change and reduce the use of plant protection products and fertilisers. The development of such varieties will help achieve the objectives of other EU policy initiatives and promote innovation to contribute to sustainability by introducing, for example, tolerance or resistance to plant diseases and pests (biotic stress), plants with increased tolerance or resistance to the effects of climate change and extreme temperatures or droughts (abiotic stress), improved nutritional characteristics or higher yields. The proposed legislation is expected to lead to more investment in agricultural biotechnology by the public sector, small and medium-sized enterprises and plant breeders.

Questions for discussion:

- **What are the initiatives that you would consider most relevant for the promotion of technologies for a double green and digital transition of the agri-food sector?**

- **How can we ensure that European agriculture can benefit from the results of research using new genomic technologies in which the EU's scientific and technological sector is a leading player?**