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Towards a sustainable food future for Europe

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Executive summary

Agriculture and food production lie at the heart of Europe's culture, society and economy and, for centuries, have helped shape its communities, its landscapes, and, critically, its relationship with the natural environment.

Yet this proud tradition is in desperate need of change in the face of major social and environmental challenges, not least the climate crisis. Addressing these and transitioning towards a sustainable food system – i.e., one that is able to deliver climate neutrality, restore, rather than deplete, nature and achieve the globally agreed Sustainable Development Goals (SDGs) – has become a matter of utmost urgency. The drivers behind this transition have only been strengthened by the Covid pandemic which has brought increased attention to health and inequality challenges.

Achieving this transition is a complex undertaking involving stakeholders from all stages of the food value chain. Yet, solutions to transform production processes, encourage sustainable consumption patterns and reduce food waste do exist.

With its new commitment to climate neutrality, the European Union and its Member States have the opportunity to create the necessary policy framework to dramatically increase the sustainability of the food system.

As the largest importer and exporter of agrifood products in the world, the EU can position itself as the global leader in transitioning to a nature positive and climate neutral food future, using the Farm to Fork Strategy, Europe's climate objectives and the SDGs as the combined compass to guide action and deliver the necessary transformational and positive change for nature, people and climate.

This briefing will explore, in greater detail, how to increase the sustainability of the food system, particularly in regard to environmental issues and climate change. The briefing looks at measures across the value chain, illustrated with best practices from the private sector, and explores how EU policies, such as the Farm to Fork Strategy, could contribute to the achievement of the transition towards a sustainable food system at EU and global level.

Our key recommendations are:

- 1. The Farm to Fork Strategy should align with the Europe's wider sustainability goals. This includes the SDGs, the EU's Biodiversity Strategy's 2030 targets to halt and reverse nature loss, and the EU's greenhouse gas (GHG) emissions reduction target of at least 55 per cent by 2030 and objective of climate neutrality by 2050.
- 2. The future Common Agricultural Policy should support higher environmental and climate ambition, and provide the right financial incentives, in alignment with the EU Green Deal. Financial incentives tied to specific environmental outcomes and well-funded 'eco-schemes', alongside technical and training support, would enable farmers and agrifood to transition towards more sustainable practices and business models.
- 3. Research and innovation programmes should accelerate the transition towards greater sustainability. Well-resourced, multi-stakeholder initiatives can drive innovative solutions, disseminate best practices, stimulate further private investments and upscale applied research.

- 4. Sustainable consumption should be encouraged and markets created for sustainable food and products. Criteria for sustainable food procurement, the harmonisation of labelling schemes and the integration of elements such as the sustainable management of natural resources and climate, health and social impacts in a common definition of sustainable consumption will increase confidence in and understanding of this concept. Transparent and accountable business commitments, and tax incentives from Member States would help facilitate uptake.
- 5. The sustainable food dimension of EU external policies, including trade and international cooperation, should be strengthened and aligned with sustainability goals. By aligning future trade agreements with the Green Deal and the Farm to Fork and Biodiversity strategies, as well as the SDGs more broadly, the EU can avoid moving unsustainable production outside its borders and create sustainable, fair and inclusive supply chains. Global business can help ensure their supply chains are sustainable, while upcoming international conferences including the UN Conference on Biodiversity (COP15) and the UN Climate Summit (COP26) should be used as opportunities for the EU to push for and steer accelerated action for the global transition towards sustainable food systems.

1. A broken food system

The biodiversity and climate crises have accelerated the need for a rapid transition to sustainable food and land use systems, and placed it at the forefront of the global and European policy agenda. Our current food system and the agricultural production that underpins it are under threat from, and contributing to, rising carbon emissions, soil degradation, freshwater scarcity and accelerated loss of plant and animal species. Moreover, the United Nations (UN) estimates that, in 2021, the combination of climate-induced dramatic weather events, such as floods, droughts and hurricanes, alongside the current Covid-19 pandemic, will result in a doubling of the number of people suffering from acute hunger globally.^{1,2} Meanwhile, even in the relatively well-off countries of the EU there are many people missing out on critical nutrients due to poor and unhealthy diets, while at the same time over half of the adult population in the EU are now overweight (often the same people suffering from poor nutrition) with dire impacts for public health and the economy.³

Food systems are inherently complex and encompass not only all the activities of getting food from farm to fork, including production, transport and retail, but also the governance and infrastructure, as well as the environmental, economic and social impacts of feeding people globally. Such systems constantly evolve in response to changes in resource availability, business and consumer demands, and public policies and regulations.⁴ The transition to more sustainable food systems is innately linked with meeting the GHG reduction commitments of the Paris Agreement and delivering the UN Sustainable Development Goals (SDGs).

Modern industrial food production methods have led to an increase in quantity, accessibility to and affordability of food, in many, but not all, parts of the world. A growth in scientific understanding, innovation and robust national and international food-related legislation means that food in Europe is of higher quality and has a longer shelf-life than ever before. Increased environmental awareness, especially among consumers, has shifted market demand and also played a part in triggering changes that have improved the sustainability of food production. However, such advances have mostly been confined to a limited number of monoculture crops, and have put a strain on land, water and energy resources, confirming agriculture's status as a significant GHG emitter.⁵ Such practice is not sustainable, particularly when considered against the backdrop of a pressing need to feed a rising global population.

The influence of EU appetites extends far beyond its borders. Through its imports of agricultural and related commodities, EU consumption is responsible for 16 per cent of tropical deforestation, second only to China. Imports of soy, palm oil and beef, followed by wood products, cocoa and coffee are key commodities predominantly linked to deforestation and the conversion of grasslands for agricultural cultivation.⁶

Within the EU, agriculture accounts for approximately 40 per cent of total annual water use, while in southern Europe this figure can exceed 80 per cent in the summer months.⁷ In the 2020 edition of the European Environment Agency's *State of Nature⁸* report, agriculture was found to be the most frequently reported cause of pressure on habitats and species. Meanwhile, the EU has failed to meet its own 2020 targets for halting biodiversity loss.⁸ In addition, pollution from agriculture (pesticides, fertilisers and other agrochemicals) remains one of the biggest threats to the health of Europe's rivers and lakes, and their wildlife.⁹ Such a vicious circle will not only result in a decline in biodiversity but also in agricultural production, including due to a decrease in pollinator numbers.

The inextricable link between food systems and climate change is undeniable. Global food systems and related land use change generate about one-quarter of annual GHG emissions¹⁰ and more than a third, if all agricultural products are included.¹¹ In Europe alone, around 15 per cent of GHG emissions are caused by agriculture and related land use change. Despite major carbon emission reductions from the sector after 1990, over the last decade they have not continued to fall.¹² We face a major challenge in reducing these further due to the complexities involved in driving continued change within this sector.¹³

The generation of huge volumes of food waste also serves to illustrate the unsustainable nature of our food system, with one-third of all the food produced globally being lost or going to waste.¹⁴ Annually, in the EU, around 87.6 million tonnes, or 173 kilograms of food per person, is lost or wasted at each stage of food retail and consumption¹⁵ at an estimated cost of €143 billion.¹⁶ Not only is this a considerable waste of resources, including water, but it also contributes to climate change as food waste is estimated to generate about 15 per cent of the EU's GHG emissions associated with the food supply chain.¹⁷



Therefore, food and the task of transitioning to sustainable food systems will become one of the defining issues of the 21st century.¹⁸ The EU is part of an integrated global food system which, collectively, must face up to the considerable challenge of feeding nearly 10 billion people by 2050, cutting GHG emissions to zero or net negative, improving soil health and productivity and reversing biodiversity loss.¹⁰

A roadmap to accelerate the transition to climate neutral and resilient food systems does already exist. The EU is a world leader in developing food safety standards, its citizens are vocal supporters of agroecological solutions and its private sector increasingly pioneers new solutions across the food chain.¹⁹ European consumers are more aware of the link between diet, health²⁰ and the natural world²¹ and, in increasing numbers, are demanding to know the provenance of their food as they seek to understand its environmental footprint. The EU's economic recovery from Covid-19 and the EU Green Deal offer a unique opportunity to support climate action, biodiversity recovery and healthier diets for all.

2. Fixing the food system

To deliver a comprehensive response to the climate and sustainability crises it is critical to look at the food system through both a social and environmental lens, rather than merely focusing on ways to increase production.

2.1 The role of business in transitioning to a sustainable food system

Businesses are increasingly being asked to account for climate and nature-related risks to the food system within their financial and operational forecasts. Investors, customers, the general public, the media and governments expect them to deliver on climate and development goals by addressing sustainability challenges, related to food production and consumption, within their value chains. The private sector, therefore, has a leading role to play in delivering the transformation of the food and agriculture sectors through both collective and individual actions. As well as there being an absolute environmental imperative for the food system to change, taking action can also be seen as a way to strengthen economic resilience and competitiveness.

In the face of these unprecedented challenges, businesses are exploring an increasing number of potential solutions including innovative technologies, restorative agricultural practices and new partnerships, including the integration of circular economy practices.²² Pioneering businesses are committing to clean and inclusive growth, contributing to the delivery of a net zero European economy by 2050 by setting ambitious objectives to decarbonise their operations and food systems' value chains while also developing projects that create green growth and jobs. They are also identifying actions and targets to halt and reverse the loss of nature to become 'nature positive'. Momentum is building around the development of science-based targets for nature to transform impact.²³ Leading businesses recognise that developing sustainable food systems is well aligned with climate action, strengthening competitiveness, delivering better health outcomes and building a more just and resilient society.



2.1.1 Towards sustainable food production

Agriculture has huge potential as one of the key solutions to the climate and biodiversity crises. Avoiding further conversion of forested land for agricultural purposes and ensuring all production is 'deforestation free' is one obvious path. However, further benefits can be achieved by introducing changes at the production stage of the food system to contribute to the removal of carbon from the atmosphere, absorbing it into the biomass of crops, grass, trees and plants on farmland, and into the carbon embedded in agricultural soil.²⁴ Agricultural processes that reduce water, fertiliser and pesticide use can improve soil health, boost biodiversity by helping to reverse the declining populations of a variety of species, including pollinating insects, and protect rivers by reducing abstraction and chemical pollution from run-off.

Regenerative agriculture:

Regenerative agriculture, favoured by an increasing number of businesses, involves transforming agricultural land to improve the health of the entire farm and associated ecosystems, rather than just focusing on yields. The World Economic Forum (WEF) estimates that a transition to regenerative agricultural practices, by 2030, could generate over 60 million jobs and \$1.1 trillion in economic opportunities.²⁵ The idea of enhancing, rather than depleting, the environment is at the core of regenerative agricultural practices. For example, planting cover crops helps to reduce erosion, weeds and the need for chemical herbicides and fertilisers, thus reducing pollution levels in the surrounding environment. Promoting soil health through regenerative practices that reduce soil disturbance, such as low- and no-till techniques, helps retain and sequester carbon in the earth.

Businesses are working with farmers and smallholders to deliver changes in farming practices, contributing to the protection and restoration of forests, soil and biodiversity. This collaboration with actors at all stages of the supply chain will be critical to the success of the transition to a more sustainable food system. A number of collaborative private sector initiatives and partnerships are focusing on building an evidence base for regenerative agricultural practices within their supply chains.

Initiated by **Danone**, the Farming for Generations alliance unites eight of the world's leading agricultural players, plus advisors,²⁶ to support dairy farmers in their journey towards regenerative agriculture, helping restore ecosystems, mitigate climate change and ensure long-term economic viability. Thanks to a collaborative and integrated approach, the alliance has been able to refine existing practices and develop new approaches. Participating farmers have access to a peer-to-peer, best practice sharing community, guidance and courses to support them with the implementation of new solutions. In Spain, fertiliser company Yara and pesticide and seed maker Corteva are working together to increase the feed autonomy of dairy farms, combining their expertise in optimising the nutrient cycle for crop management and improving silage quality with corn hybrids.

Unilever's Regenerative Agriculture Principles (RAPs)²⁷ are focused on nourishing the soil, increasing farm biodiversity, improving water quality and climate resilience, capturing carbon, and restoring and regenerating the land. In practice, Unilever will implement the principles through specific projects focused on different crops and locations to understand locally adaptable solutions. In Spain, Unilever-owned food and beverage brand Knorr is partnering with tomato supplier Agraz to help improve soil health and irrigation by using cutting-edge sensors that regulate and reduce water use. This initiative builds on Unilever's Sustainable Agriculture Code (SAC), a collection of best practice principles for farming that, since

2010, hundreds of thousands of farmers have used to make their operations more sustainable. Unilever also supported the establishment of the Sustainable Agriculture Initiative (SAI) platform that convenes over 130 member companies and organisations with the aim of fostering sustainable agriculture practices and establishing sustainable food systems.²⁸ Initiatives such as the SAI underline the growing support among businesses to accelerate sustainable food systems.

Innovative solutions:

Innovative technologies also have a key role to play in improving the sustainability of the food system. They can contribute to decreasing emissions from livestock, help tackle water stress, reduce the use of pesticides and increase energy efficiency.

The science and nutrition company **Royal DSM** is leading the way in innovating livestock feed targeting methane, nitrous oxide and ammonia emissions, to significantly reduce the climate impact of animal farming. Several DSM feed solutions, such as Bovaer[®] (which reduces methane emissions from ruminants by at least 30 per cent) and VevoVitall[®] (which reduces ammonia emissions by up to 18 per cent in swine) help in this effort. According to a recent UN report, moves to cut methane emissions, more potent but shorter-lived GHGs than carbon dioxide, are central to slowing down climate change in the short term.²⁹

Another innovative approach is the cultivation of agriculture in controlled environments such as greenhouses, vertical farms and land-based fish farms. Such alternatives to open-field agriculture and open sea fishing require less space land and minimise environmental impacts. For example, growing food plants indoors through vertical farming can achieve higher yields with a reduced environmental footprint and pesticide-free cultivation. Indoor farming also reduces waste from fertilisers and water pollution as plants are only fed the amount they require through water (hydroponic) or misting onto dry roots (aeroponic) processes.³⁰ **Signify** has developed greenhouse and vertical farm lighting innovations that are more energy efficient than high-pressure sodium (HPS) lamps. Vertical farms can also be located close to towns and cities, significantly reducing 'food miles' and allowing for numerous applications in urban settings.

Innovative agricultural practices that manage water use more efficiently save costs as well as delivering GHG reductions and nature benefits. **Coca-Cola**'s European water replenishment pilot projects have seen it work with local partners in Spain to optimise water usage on 40 citrus farms. The project provided training for farmers and invested in improved irrigation and monitoring equipment. This resulted in an annual water saving of over half a billion litres and an average yield increase of 11 per cent.³¹

Circular economy solutions:

Circular economy practices can also benefit the food system. **Stora Enso** repurposes pulp and paper mill sludge as a natural soil improver. As the sludge contains nutrients and organic carbon, it is a valuable resource for farmers and eradicates the need for chemical fertilisers. Results show benefits for plant production, soil fertility and water retention capacity. Meanwhile, carbon dioxide emissions are reduced as carbon is stored in the soil and emissions from fertilisers are avoided. Stora Enso's soil improvers have been highly effective in reducing nutrient leakage from farmlands, thus benefiting the wider environment.

2.1.2 Towards sustainable food consumption

Shifting food consumption patterns in Europe towards more plant-based and alternative protein diets help reduce GHG emissions from the food system and may also contribute to health improvements. As livestock production demands greater inputs of resources and is associated with pressure to convert forests into pastureland, the climate benefits of reduced meat diets are significant. Every gram of protein from beef and other ruminant meats requires over 20 times more land and generates more than 20 times more emissions than cultivating pulses.³²

The popularity of vegetarian food has been increasing and Europe's plant-based food and beverage market is projected to grow by almost nine per cent between 2020 and 2025.³³ Drivers of this trend include consumer preference for greater choice and health benefits, as well as concern about the environmental impacts of food production, including climate change, biodiversity and animal welfare.^{34,35} Many companies are now investing in alternatives to meat products, such as plant-based, laboratory-cultivated meat or protein alternatives obtained through fermentation.³⁶

DSM has been an innovator in providing meat and dairy alternatives that deliver an authentic, meaty taste and texture and the desired nutritional value. Intrinsic to this is the challenge of being able to provide enough quality proteins in a fair and sustainable manner, from a variety of sources, while also raising consumer awareness of the positive dietary impacts and eliminating the staggering levels of food waste.

Danone has a diverse portfolio of dairy and plant-based brands to help and support people in adopting healthier and more sustainable eating and drinking practices. The strategic acquisition of a significant plant-based product portfolio in 2017 reflected a desire to bring a wider choice to all consumers, especially those looking to diversify their protein sources. **Coca-Cola** has also introduced plant-based and more nutritious beverages under the AdeS brand family and the dairy alternative products by innocent drinks.

However, it should be noted that animal proteins are expected to continue to remain a culturally important part of people's diets and provide a livelihood for millions of farmers and communities globally. Therefore, for all forms of protein, it is essential to reduce GHG emissions and other environmental impacts, while maintaining high nutritional standards. Food availability, affordability, as well as overall poverty levels and general understanding of nutritional good practice are also key to support public health and good diets.

2.1.3 Eliminating food waste

Tackling food loss and food waste is essential in increasing the efficiency of our food systems while reducing harmful emissions from waste. Food that is produced but never eaten not only contributes to agriculture's environmental impacts but, as landfill, becomes an additional source of emissions. Reduction of food loss and food waste could also help achieve greater food security for a growing global population by promoting optimal use of available natural resources. Food loss and post-harvest losses due to lack of sufficient investment in processing, storage and transport (i.e., lack of infrastructure) are characteristics of developing countries' food systems. In the EU, it is food waste, at the retail and consumption stages of the food chain, which is the major challenge, making up 70 per cent of overall food loss and waste.³⁷

Governments, as well as companies, are committing to raising consumer awareness and providing an array of food waste reduction initiatives and actions.³⁸ Key opportunities to reduce food loss and food waste can

be addressed through interventions that seek to improve infrastructure, storage, processing and transport, as well as behaviour change at the retail and consumption stages. Improving the use of date marking on food and increasing consumer understanding are essential. A 2018 study estimated that up to 10 per cent of the food waste generated annually in the EU is linked to date marking.³⁹

In Europe, as much as 50 per cent of all food waste occurs at household level.³⁸ Research indicates that if shelf life, a key driver of purchasing behaviour, were increased by just one day, this measure could prevent up to 0.2 million tonnes of annual household food ending up as waste.⁴⁰ **DSM** is partnering with the world's leading food brands, and their portfolio of bio-preservatives and antioxidants creates solutions that help manufacturers keep products fresh for longer, prevent spoilage and reduce food waste. **Stora Enso** and other businesses have been working on packaging that prevents food waste by prolonging shelf life. Packaging that allows some consumables to be stored for up to 12 months, without refrigeration, can help reduce spoilage in the distribution phase of the food system, and eliminate GHG emissions associated with the refrigeration process. Similarly, in its work to develop improved lighting for indoor farming facilities, **Signify** has discovered ways of controlling the colour spectra and light which can extend the shelf life of crops by up to six days, resulting in less food chain waste.



3. Policies for the transition to a sustainable food system: is the EU on the right track?

The European Commission has the ambition to lead the green transition and make the European food system the 'gold standard' for sustainability.⁴¹ Under the Green Deal, the EU has an opportunity to develop the appropriate policy framework to achieve this objective, with the Farm to Fork Strategy at its core and additional interventions throughout the entire food value chain. However, success requires the alignment of food-related policies, such as the Common Agricultural Policy, and other external policies, with environment and climate objectives including the EU's objective to achieve climate neutrality by 2050 and the SDGs. Moreover, this policy framework should provide incentives and support for all stakeholders within the food value chain to develop sustainable practices and contribute to the transition towards a more sustainable food system in Europe and globally. A proving ground for these policies will be their ability to incentivise and empower businesses to invest in the transformation and adopt new models and practices.

These are five key recommendations regarding what the EU should do:

Use the Farm to Fork Strategy and Europe's wider climate and sustainability goals as a compass to guide action

The objective of the Farm to Fork Strategy, launched in May 2020, is to accelerate the transition towards a sustainable food system through a holistic and comprehensive approach. The strategy recognises the links between 'healthy people, healthy societies and a healthy planet'.⁴¹ It provides a roadmap with actions for policymakers and stakeholders from sustainable food production and sustainable food consumption to food loss and waste prevention. The strategy has the potential, if successfully implemented, to address the urgent challenge of increasing the sustainability of the food system, leading to significant climate, environmental, economic and health benefits.

The strategy contains a range of concrete 2030 targets that provide clear objectives around which all actors in the food system value chain, including businesses, can develop impactful actions. These include a 50 per cent reduction in the use of chemical and hazardous pesticides; a 50 per cent reduction in nutrient losses while ensuring no deterioration of soil fertility; a 20 per cent reduction in fertiliser use; and a 25 per cent increase in the use of EU land for organic farming. These ambitious targets sit alongside the EU's commitment, under SDG12, to halve per capita food waste at retail and consumer level. In order to reduce the currently annual estimated 33,000 human deaths in the EU/EEA resulting from antimicrobial resistance, the strategy also aims to reduce sales of antimicrobials used for farmed animals and aquaculture by half.⁴²

The European Commission has already made progress with the development of various initiatives. The Commission has set up a comprehensive action plan for organic production in the EU with the objective of achieving the organic farming target.⁴³ The *EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'* outlines a series of flagship initiatives to improve soil quality by reducing nutrient losses and chemical pesticide use by 50 per cent. These include the upcoming revision of the Directive on Sustainable Use of

Pesticides in 2022, the promotion of agroecological practices and of innovation and exchange of knowledge through a proposed 'Mission in the Area of Soil Health and Food'.⁴⁴ In 2023, the Commission will issue a proposal on food waste reduction. In order to successfully achieve SDG12's commitment to cut food waste by half, the food waste target must be binding and apply throughout the value chain, from production to retail, and be accompanied by a rigorous impact assessment.⁴⁵ More broadly, **it is also essential for the implementation of the Farm to Fork Strategy to be consistent with the overall objective of the EU's Biodiversity Strategy and the need to halt and reverse nature loss by 2030**.⁴⁶ These targets are important as they enable the monitoring of progress and facilitate accountability for the actions of different stakeholders in food value chains.⁴⁷

However, the Farm to Fork Strategy lacks further clarity on how it will ensure that food-related policies are consistent with the EU's broader sustainability goals and climate objectives.⁴⁸ An upcoming legislative framework proposal for a sustainable food system in 2023, which aims to mainstream sustainability in all food-related policies, will provide the opportunity for the Commission to offer clarity. It is crucial that both the SDGs and the Paris Agreement remain the overarching roadmap for a strategy consistent with climate mitigation efforts and nature objectives. **The Farm to Fork Strategy must deliver on its commitment to ensure that agriculture and the food value chain contribute to the EU's GHG emissions reduction target of at least 55 per cent by 2030, a central objective to achieve climate neutrality by 2050.**

Ensure that the future CAP supports higher environmental and climate ambition and provides the right financial incentives

Given the urgency of increasing the sustainability of the food system, the alignment of food policies with sustainability and climate objectives is essential. As such, **the future Common Agricultural Policy (CAP) must be aligned with the EU Green Deal** and should support higher environmental and climate ambition, **and dedicate appropriate resources to finance the transition to a sustainable food system and support necessary investments.**

The CAP, which has been allocated €55.8 billion under the new EU budget⁴⁹ and is expected to account for between 40 and 45 per cent of the overall EU budget contribution to the Green Deal,⁵⁰ can provide the necessary financial support and incentives for farmers, land users and the agrifood business to respond to environmental and climate challenges and reduce emissions from the agriculture sector. **'Eco-schemes'**, **developed under the CAP**, will have a crucial role to play in this endeavour and should be allocated a substantial share of funds. These eco-schemes aim to directly support farmers to adopt environmental and climate-friendly practices and boost funding for practices such as precision agriculture, agroecology, carbon farming and agroforestry. As such, they can act as entry-level schemes by covering costs for farmers and businesses to transition to these practices and business models. In parallel, the European Commission has also announced a €15 billion European Agricultural Fund for Rural Development to support rural areas in the transformation necessary to align with the EU Green Deal, and achieve the targets set out in the Farm to Fork Strategy and the Biodiversity Strategy.

The success of these financial instruments under the CAP will depend on implementation at national level. In accordance with the new CAP, agreed in 2018,⁵¹ Member States need to develop their intervention strategy and plans to use CAP funds in national CAP strategic plans (CSPs). These strategies are required to show an active contribution to the EU's environmental and sustainability objectives and must be submitted by January 2022. This new model provides an opportunity to increase the sustainability of agrifood systems through more targeted and coherent approaches while ensuring a fair income to farmers and protecting food and health quality. However, there is a lack of clarity on how Member States intend to align their plans with sustainability objectives and allocate appropriate funding. Therefore, it is necessary to establish monitoring and transparency rules that ensure these CSPs meaningfully contribute to the transition towards sustainable food systems at national level.⁴⁸

In order to achieve the necessary results, financial incentives, under the CAP, should be tied to specific environmental outcomes and the achievement of targets under the Farm to Fork and Biodiversity strategies, such as the protection of biodiversity and restoration of damaged ecosystems. In addition, subsidies should have a set of 'do-no-harm' requirements attached to them with environmentally harmful subsidies phased out. Penalties and fines could also be applied for the use of polluting inputs, in line with the 'polluter pays' principle.⁵² The lack of enforcement of relevant pollution legislation weakens farm business confidence to invest in mitigation measures and solutions. Furthermore, this lack of regulatory oversight makes it more difficult for them to qualify for private loans to finance these measures.

As a complement to unlocking and targeting finance, policies and measures should raise awareness among farmers and businesses on how biodiversity and environmental challenges can affect their activity, on the economic benefits related to the adoption of more environmentally and climate friendly practices, and on how policies can enable them to develop these practices. In this regard, the Farm to Fork Strategy does recognise that strengthening the sustainability of the food system can "build the reputation of businesses and products, create shareholder value, improve working conditions, attract employees and investors, and confer competitive advantage, productivity gains and reduced costs for companies".⁴¹ In addition, technical assistance and training programmes should be developed at national and EU levels to ensure farmers and workers develop the necessary skills to increase the sustainability of their activities, including digital skills for smart farming practices. Digital skills are in growing demand in a sector where an ageing workforce and limited access to educational opportunities currently restrict their uptake.⁵³ Changing the professional profile of farmers to a more digital one could help attract younger workers and revive rural communities.

Scale up research and innovation for sustainability

The Farm to Fork Strategy highlights research and innovation as key drivers needed to accelerate the transition towards sustainable, healthy and inclusive food systems, from primary production to consumption. This important role has been taken into account in recent policy developments and initiatives.

The European Commission's Directorate General for Research and Innovation has set aside ≤ 1.8 billion in support of the implementation of the Farm to Fork Strategy through its Strategy on Food 2030 pathways to action.⁵⁴ This encompasses key areas such as alternative proteins, agroecological approaches and living laboratories. In addition, Horizon Europe, the EU's main funding programme for research and innovation, contains a cluster on *Food, Bioeconomy, Natural Resources, Agriculture and Environment*, with a budget of ≤ 8.952 billion and a specific research area on *Food Systems* to increase the role of research and innovation in the acceleration of the transformation. Under this initiative, the Commission is convening a partnership for *Safe and Sustainable Food Systems for*

People, Planet and Climate, which is expected to bring together national, regional and European research and innovation programmes and food systems actors to deliver innovative solutions and increase investments for nutrition, climate, circularity and communities, while also strengthening EU leadership in food systems transformation.^{55,56,57,58}



These are positive developments that can form the basis of a comprehensive approach to research and innovation in the area of food and agriculture, stimulate private investment in innovation and upscale applied research and the dissemination of best practice; all important solutions to address the lack of sustainability within the current food system. These research and innovation programmes and financing mechanisms should also include alternative solutions to open-field agriculture such as 'agriculture in controlled environments', including greenhouses and vertical farms, which provide energy efficiency gains, reduce the use of fertilisers and eliminate the use of pesticides. They should also consider the development of nature-based solutions that help to increase climate resilience, conserve water and stimulate biodiversity and economic development. Lastly, **one important element to provide a food systems approach will be to examine the various stages of the value chain**. These should include filling existing research gaps at the consumption level to develop a better understanding of consumer behaviour and solutions to increase sustainable choices.⁴⁸

Encourage sustainable consumption and create markets for sustainable food

While traditional agrifood policies in the EU tended to focus on production, **the Farm to Fork Strategy places a new emphasis on consumption**, thereby creating opportunities for interventions in an area of the value chain that has seen moderate progress and limited policy interventions. Actions at this stage of the value chain are also paramount in creating markets for sustainable food and products. The Farm to Fork Strategy places a focus on labelling, with an upcoming proposal for a "sustainable food labelling framework to empower consumers to make sustainable food choices", to be announced in 2024.⁴¹ This provides the EU with an **opportunity to harmonise labelling schemes across the single market**. While labelling constitutes a useful tool to inform consumer choices, it needs to be complemented by additional measures to achieve the necessary shift to sustainable diets.⁴⁵ As an example, **the Farm to Fork Strategy proposes the introduction of minimum mandatory criteria for sustainable food procurement** to support local and regional authorities in providing sustainable food for schools, hospitals and public institutions. By doing so, the strategy explicitly recognises that measures to shape demand for sustainable food will also have a positive upstream effect at production level as they will incentivise farmers to adopt environmentally friendly practices.⁴¹

The Farm to Fork Strategy also refers to the "Sustainability health diets – guiding principles" of the Food and Agriculture Organization (FAO) and World Health Organization (WHO) which emphasize the role of food consumption in the achievement of several SDGs including ending poverty and hunger, ensuring good health and well-being, gender equality and acting against climate change. According to these guidelines, moving to plant-based diets will reduce the environmental impact of the food system.⁵⁹ However, the strategy does not identify a clear definition of what constitutes a 'sustainable diet'. Yet **establishing a common definition of sustainable consumption, integrating elements such as the sustainable management of natural resources and climate, health and social impacts, is an essential factor in determining actions at the consumption level and increasing consumer awareness, especially given the absence of concrete targets on this in the Farm to Fork Strategy.**

In addition, more must be done at EU and national level to create markets for sustainable food and **products**. In order to reflect the cost of sustainability in commodities, Member States could be encouraged to reduce VAT rates for sustainable food and phase out the current reduced VAT rates for unsustainable for the current reduced VAT rates for unsustainable for the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the current reduced VAT rates for unsustainable food and phase out the

Companies also have a clear role to play. **The Commission will launch a 'Code of Conduct for Responsible Business and Marketing Practices'**, setting actions that stakeholders between the farm to fork including food processors, hospitality and food service operators and retailers, can voluntarily commit to in order to improve and communicate their sustainability performance, making it easier for consumers to choose healthy and sustainable diets.⁶¹ In order for the code to be credible, these **commitments should be tied to monitoring and reporting requirements**.

Strengthen the sustainable food dimension of external policies

As the world's largest importer and exporter of agrifood, the EU has a key role to play in making international value chains more environmentally sustainable. The Farm to Fork Strategy states that the EU will support the global transition to sustainable agrifood systems, in line with the objectives of the strategy and the SDGs. As such, the strategy aims to use the EU's external policies, including international co-operation and trade policies, to achieve this objective. Yet the sustainable food dimension of external policies needs to be strengthened.

With regard to trade, the EU has committed to ensure the inclusion of an ambitious sustainability chapter in all bilateral trade agreements and declared that it will increase co-operation to secure ambitious commitments from international partners on the use of pesticides. **The Farm to Fork Strategy also states**

that the compliance of imported food with EU regulations and standards should continue and that the Commission will assess requests for import tolerances for pesticide substances no longer approved in the EU. While these constitute positive developments, the EU must ensure that its trade agreements are aligned with the objectives of the Green Deal and targets of the Farm to Fork and Biodiversity strategies, and the SDGs more broadly, to avoid simply shifting harmful production outside its borders and create sustainable, inclusive and fair value chains.

The Commission is also set to present a legislative proposal and measures, before the end of June 2021, to avoid, or **minimise, the placing of products associated with deforestation or forest degradation on the EU market**. This is a much anticipated policy development, not least because the EU is responsible for 16 per cent of tropical deforestation linked to international trade and its associated emissions, making it one of the world's largest 'consumers'.⁶² According to WWF, the proposal should incorporate other ecosystems also threatened, including agricultural land that is valuable for climate and biodiversity, such as grasslands, wetlands and mangroves. It must also go beyond ensuring that commodities are 'just' produced legally by ensuring compliance with human rights and environmental sustainability criteria.⁶³

Some agrifood businesses and retail corporations, including Ahold Delhaize, Aldi, Carrefour and Jumbo, issued a 'Statement for an effective EU law to halt the trade in commodities and products linked to deforestation and conversion'⁶⁴ which calls on the EU to set requirements for increased supply chain transparency and traceability for all companies, to develop a clear legislative framework including a due diligence obligation, to include the finance sector and institutions financing commodities and products, to address both deforestation and the conversion of other natural ecosystems as well as their degradation, and work in partnership with producer countries to address underlying root causes.



Financial institutions can play a valuable role to support ongoing anti-deforestation efforts. The *Banking Beyond Deforestation* report by CISL sets out an action plan for the banking industry to help halt and reverse deforestation first and foremost through an alignment of anti-deforestation standards across banks and the creation of a common set of data which would enhance the traceability of commodities and enable importers of these commodities to better understand their supply chains.⁶⁵ The EU should encourage this alignment of standards and co-operation and introduce a taxonomy that supports investment in forest restoration by local communities, such as landscape financing definitions linked to forest stewardship, to guide investors. Actions in this area are all the more crucial as the climate objectives of the Paris Agreement will not be met without tackling deforestation.

Moreover, according to the European Environment Agency (EEA) briefing *Global climate change impacts and the supply of agricultural commodities to Europe*, while being mostly self-sufficient for cereals and vegetables, Europe is heavily reliant on imports for animal feed, such as soybean and maize and commodities for secondary processing such as palm oil, beet and cane sugar.⁶⁶The briefing recommends that to reduce the risks of supply disruption, the establishment of trade relations with an increased number of countries and the diversification of the EU's import portfolio should be implemented.

In the context of international co-operation, the Farm to Fork Strategy states that the EU will strive to promote high sustainability standards and promote the global transition to sustainable food systems in international conferences. A number of significant international conferences, in 2021, linked to transitioning to sustainable food systems, will act as a litmus test over the EU's willingness and capacity to push for, and steer, accelerated action towards this global transition. These milestones include the High Level UN Secretary-General's Food Systems Summit, the first of this kind in the UN's history, in September or October 2021. The UN Biodiversity Conference (COP15), 11–24 October, will negotiate new targets to protect and restore biodiversity and could recommend action on sustainable food production for the post-2020 global biodiversity framework. The UN Climate Summit (COP26), 1–12 November, could also provide an opportunity to reinforce commitments on food systems. A recent positive development has been the release of the Commission communication on a 'Global Approach to Research and Innovation', highlighting the Commission's intention to support multilateral co-operation on research and innovation policy for "fair, healthy and environmentally-friendly food systems".⁶⁷ Such co-operation could come through the International Bioeconomy Forum, the International Research Consortia and the Global Research Alliance on Agricultural Greenhouse Gases.^{68,69}

Finally, due diligence for businesses is an important element of success for the transition towards more globally sustainable food systems. Companies should, therefore, be encouraged to make their international supply chains more sustainable. In the run-up to a Commission proposal for a binding due diligence directive, the European Parliament passed a resolution to tackle environmental and human rights issues in EU business supply chains. The parliamentary report strongly supports mandatory due diligence to ensure supply chains do not include environmental or human rights violations.⁷⁰ As referenced by the report, requirements should be in line with the FAO–OECD *Guidance for Responsible Agricultural Supply* Chains.⁷¹ These aim to help agribusinesses and investors mitigate adverse impacts in their value chains and make them more sustainable by developing a common due diligence framework and globally applicable benchmarks. These guidelines include measures for environmental protection and sustainable use of natural resources under which businesses commit to prevent, minimise and remedy pollution and negative impacts on air, land and soil; reduce greenhouse gas emissions; ensure the sustainable use of natural resources and increase the efficiency of resource use and energy; reduce food waste and promote recycling; and increase the resilience of agriculture and food systems by addressing the impacts of climate change.⁷¹ The guidelines also cover the social dimension with measures to ensure compliance with core labour standards and social security schemes, prevent abuses of migrant workers and respect of human rights.

4. Key recommendations



Use the Farm to Fork Strategy and Europe's wider climate and sustainability goals as a compass to guide action:

The Farm to Fork Strategy aims to accelerate the transition towards a sustainable food system by triggering actions at all stages of the value chain guided by a set of concrete targets. If successfully implemented, the strategy does have the potential to address the urgent challenge of increasing the sustainability of the food system, bringing about significant climate, environmental, economic and health benefits. In order to really deliver the necessary transformational change for nature, climate and people, the Farm to Fork Strategy must be consistent with the SDGs and with the objective of the EU's Biodiversity Strategy to halt and reverse nature loss by 2030, and must deliver on its commitment to ensure that agriculture and the food value chain contribute to the EU's GHG emissions reduction target of at least 55 per cent by 2030 and the objective to achieve climate neutrality by 2050.



Ensure that the future CAP supports higher environmental and climate ambition and provides the right financial incentives:

The future CAP must be aligned with the EU Green Deal and support higher environmental and climate ambition. As such, it should dedicate appropriate resources to finance the transition to a sustainable food system and allocate a substantial share of funds to 'eco-schemes' which have a crucial role to play in this endeavour by enabling farmers and agrifood to transition towards more sustainable practices and business models. The success of these financial instruments will heavily rely on the ability and willingness of Member States to target them towards activities consistent with sustainability and climate objectives and ensure a fair income for farmers. Financial incentives under the CAP should be tied to specific environmental outcomes. Subsidies should have a set of do-no-harm requirements attached to them, with environmentally harmful subsidies being phased out. Financing should be complemented with measures that raise awareness of farmers and businesses of the economic benefits related to the adoption of more environmentally and climate-friendly practices, and technical assistance and training programmes to develop farmers' and workers' skills and revive rural areas and communities.



Scale up research and innovation for sustainability:

The Farm to Fork Strategy rightly recognises that research and innovation are key drivers to accelerate the transition towards a sustainable and inclusive food system from primary production to consumption. Research and innovation programmes, including a cluster on *Food, Bioeconomy, Natural Resources, Agriculture and Environment* under Horizon Europe, have started to put together financial resources and multistakeholder partnerships that can increase investments and accelerate the development of innovative

solutions. This is a necessary approach as the ability to disseminate best practices, stimulate private investments in innovation and upscale applied research are all important solutions to address the unsustainability of the current food system. Research and development programmes should consider a wide set of innovative solutions, including alternatives to open-field agriculture such as 'agriculture in controlled environments' and the development of nature-based solutions. A comprehensive food systems approach in this field also involves filling existing research gaps at the consumption level.



Encourage sustainable consumption and create markets for sustainable food:

The Farm to Fork Strategy provides an opportunity to increase demand and create markets for sustainable food and products. The strategy can contribute to harmonising labelling schemes throughout Europe, which have a role to play in the shift towards more sustainable consumption patterns. However, this shift will necessitate additional measures such as minimum mandatory criteria for sustainable food procurement, currently considered in the Farm to Fork Strategy, and the establishment of a common definition of sustainable consumption, integrating elements such as the sustainable management of natural resources and climate, health and social impacts. In order to reflect the cost of sustainability in commodities, Member States could be encouraged to reduce VAT rates for sustainable food and phase out current reduced VAT rates for unsustainable fertilisers and pesticides. Businesses, which have a crucial role to play in this area, should adopt commitments that are tied with monitoring and reporting requirements.



Strengthen the sustainable food dimension of external policies:

The Farm to Fork Strategy states that the EU will support the global transition to sustainable agrifood systems. Yet, the sustainable food dimension of external policies, including trade and international cooperation, will need to be strengthened for the EU to truly and effectively drive this transition. The EU should ensure that its trade agreements are aligned with the SDGs, with the objectives of the Green Deal and with the targets of the Farm to Fork and Biodiversity strategies, to avoid simply moving harmful production outside its borders and create sustainable, fair and inclusive value chains. Imported food must comply with EU environmental regulations and standards, and the placing of products associated with deforestation or forest degradation on the EU market should be minimised. In the context of international co-operation, upcoming international conferences like the UN Secretary-General's Food Systems Summit, the UN Conference on Biodiversity (COP15) and the UN Climate Summit (COP26) will serve as a litmus test regarding the EU's willingness and capacity to push for and steer accelerated action for the global transition towards sustainable food systems. As due diligence for business is an important element, companies should be encouraged to make their international supply chains more sustainable.

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