Report

Just transition in the EU agriculture and land use sector

Institute for European Environmental Policy

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Transition and just transition for the agricultural sector

Transition is the term widely used to describe the transformations of major aspects of social, economic and cultural life necessary to mitigate the climate and biodiversity emergencies in particular. The transition signalled by the EU Green Deal requires strong structural, technical and behavioural change in production, distribution and consumption in many sectors of the economy and society, including agriculture, associated land use and the wider food system.

There is established analysis that the results of *not* making these necessary transitions would be catastrophic, with long-run costs far exceeding the likely costs of taking action to avoid the worst damage. Particularly for climate there is general agreement that transition delayed implies higher long-run costs. Consequently, impediments and delays, including those caused by prospective losers of transitions, will themselves impose burdens on society as a whole and thus injustice through the greater losses likely to be suffered by those in the poorest parts of the EU and the world, and by future generations.

Conceptualisations of what constitutes a just transition, whether globally or in Europe vary. In relation to the Green Deal, it can be summarised as the process of engaging and addressing the social and economic effects of the transition to a carbon neutral, nature positive society, focussing on the regions, industries, workers and citizens who will face the greatest challenges.

The agriculture and land use sector

The concepts of transition and just transition take on a distinctive character when applied to the agricultural and food sectors. In addition to the need to meet targets for greenhouse gas (GHG) emission reductions, the escalating concern about dietary health must be addressed, along with specific questions about the role of livestock and the need to reverse the loss of biodiversity, of special relevance to agriculture because of its dominance of land use in many countries.

The land-based sector is distinctive because of its strategic role in food security, the fact that it extends over a large part of the territory and because it impacts on water, air, climate and nature in profound ways. It is managed in mainly fragmented small and micro family businesses on a wide diversity of soils, climate, topography and ecosystems. Land managers are embedded between highly concentrated upstream suppliers and downstream processors, retailers and food service companies. Many farms have no paid workers but there are some with a significant workforce, including a group that are heavily reliant on casual and

seasonal workers. Rather exceptionally there is already extensive policy intervention, not least via Europe's Common Agricultural Policy (CAP). Because of these special features, the form, complexity and consequences of change will be distinctive as well.

Unlike sectors facing redundant technologies and outright factory closure and cessation of production, agriculture and land use will continue in many cases but has to be transformed. Just transition for this sector will therefore go beyond the classical policy instruments for this purpose namely: financial redundancy payments, retraining and skilling, regional investment strategies and ensuring the mobility of the work force. The overall approach and measures selected must meet the multiple challenges of climate and biodiversity protection, as well as improving the health and well-being of the population and social and economic conditions in the agricultural sector, whilst maintaining viable and vibrant rural communities.

The policy context for agricultural transition

Following the Green Deal in the EU, policy drivers are being put in place to commence a process of transition which explicitly includes the food and agricultural sectors. These are not yet fully developed or adopted formally and even together they are insufficient to bring about net zero GHG emissions in the sector. They signal a significant step towards transition and potentially they have an important role to ensure it is just. The key elements are:

- The commitment to net zero GHG emissions by 2050 including proposals for agriculture and land use
- The Farm to Fork Strategy
- Specific strategies for biodiversity, forestry and soils
- Proposals on zero pollution and animal welfare

As well as legislative, advisory and new market development instruments, a principal delivery tool for implementing these strategies and the associated targets will be the EU's Common Agricultural Policy (CAP), the latest stage of which will run from 2023 until 2027. Uniquely therefore, agriculture already has access to substantial EU funds that can be drawn on to help transition. However, the current set of CAP mechanisms is a long way from a specifically tailored just transition plan for agriculture and has not yet been fully aligned with the logic of the Green Deal. Some of the ingredients are present, not least the budget, but further initiatives are necessary within a more focused transition plan.

Given the decentralisation of decision making to Member States which is a core aspect of the latest CAP reform, much now depends on the degree to which Member States and then their farmers decide to commit to the kinds of transitional steps embraced in the Green Deal targets. How far this will happen in practice remains to be seen. The example of the proposed "National Programme for Rural Areas" in the Netherlands will be of particular interest.

What kind of transition is envisaged

The technical composition of the transition is less clear and more contested for the land-based sectors than it is for power and for transport which are dominated by climate considerations. The land sectors must pay equal regard to biodiversity and habitats, water and soil. Dietary considerations and health have also to be an integral part of the transition. The specific challenges of determining the safe operating space for livestock, and integrating the changes in agriculture, forestry and peat management are further complications.

The debates on agricultural transition generally accept that it will comprise at least four structural elements:

1. Changes in the overall composition and quantity of food being produced, alongside changes in consumption patterns, including increased plant-based foods.
2. A reduction in the agricultural area allowing more land devoted to carbon sequestration in forests and peatlands and biodiversity restoration and conservation.
3. Changes in the mix of farming systems and accompanying practices. This will give rise to a range of systems spanning different levels of intensity extending from organic farming and agroecology to contained, vertical cropping systems and cell culture.
4. A systematic focus on reducing both carbon and non-carbon GHG emissions, energy use, curtailing waste and increasing recycling in the primary production sector.

The implications of just transition in agriculture

The balance of these elements of transition is far from agreed. It will differ between Member States confronting their own priorities. This makes it difficult to identify precise patterns of change that will arise and the implications for both farmers and the environment. A Green Deal-based transition would create socio-economic impacts for both consumers and producers. These will stretch beyond those employed in farming to the whole food chain, a substantial source of

employment in most Member States. For agriculture some changes would be felt relatively rapidly, others more gradually with farmer succession.

Potential winners from transition include:

- Producers able to exploit new added value markets such as: nuts, fruit and vegetables, and higher welfare livestock products.
- Producers of crops relying on pollination.
- Leaders in lower impact food production such as organic suppliers.
- Producers establishing a competitive position in the use of new technologies such as biocontrol. Early adopters in higher-welfare livestock systems could be in this group.
- Providers of new inputs, knowledge and training.
- Those producers in well-organised collective structures able to share knowledge, costs of new equipment, the costs of new market development efforts.
- Land management businesses where recreation, amenity and hospitality-based activity is enhanced by the transformed rural environment.
- Producers in Member States with targeted support for the transition through policy measures and the establishment of new ecosystem markets, for example for carbon.
- Some may benefit from increased land prices with the development of private or public markets in environmental services such as carbon sequestration.

On the other hand, some socio-economic costs and disadvantaged producers will be difficult to avoid. Acknowledging that those who work in the farm sector are exposed to uncertainties and risks that need to be addressed as well as to potential gains might alarm some interests but also could be seen as an avenue towards constructive engagement on a realistic basis.

An illustrative list of potential losers from transition includes:

- Livestock producers and farm workers who cease to be able to make a living from this form of production and face stranded assets;
- Livestock farm workers and employees in meat processing and service sectors;

- Farms where the barriers to change are particularly high because of the farmer's age, the small scale of the holding, unfavourable tenure conditions, lack of access to capital, remoteness or difficulties in entering co-operatives;
- Farmers and workers on soils on which are re-wetted and removed from production or confined to paludiculture;
- Some producers with a particularly high reliance on agrochemical inputs which will be subject to measures to discourage current levels of use;
- Providers of agrochemical inputs (although there will be some market expansion for alternative methods of pest control, for example biocontrol);
- Less educated/elderly farmers unable to retrain for programmes essential for compliance with legislation or more demanding market conditions;
- Farmers, farm workers and supply chains in regions where less sustainable systems are concentrated and new investment is more difficult to justify, for example areas with acute water shortages;
- Farmers and farm workers in regions with relatively limited government support for transition, few attractive incentive schemes, limited private markets and poor information provision.

More controversial and least clear is the extent to which losses may occur in the mainstream arable sector producing cereals, oilseeds, pulses, roots and other crops on a large scale. Will reduction in input and production intensity reduce already marginal profitability per hectare, or will this be offset by a corresponding price increase? The evidence base on this is slender.

Policy proposals: Towards a more just transition for agriculture

A balanced transition plan should be developed, with input from a broad range of stakeholders to spell out the steps required, the responsibilities to be shouldered and the role of different actors in doing so. Specific EU-led and EU-funded measures will be part of this, alongside measures at Member State level. This will need a timetable and clear sightlines on the meeting of targets, acknowledging the role that the sector will play, the importance of the farming community, including workers, in building a sustainable future and the ways in which this will be a just transition.

Ten components are suggested for a balanced policy approach within such a plan:

1. Enhanced engagement with the farming and land managing communities;

2. Preparatory, analytical and supportive work;
3. Building knowledge, skills and capacity;
4. Fair terms and fair prices for farmers in the food chain;
5. Developing new income streams and markets for sustainable activities;
6. Better use of CAP basic payments to support greater environmental sustainability;
7. Targeted supplementary transition aid;
8. Fairness between Member States: aligning the distribution of the CAP budget with the requirements of transition;
9. Fairness for rural communities;
10. Fairness amongst consumers.

Concluding thoughts

Given the scale of agricultural transition now needed in Europe it merits a larger place in the political dialogue about future policy and a specific plan additional to other transition programmes. It is not too soon to consider where costs might fall and how to bring fairness to a transition that is strongly in the interest of society as a whole.

Plans for just transition must be built on a fuller evidence base of how policies are to be developed and implemented, together with developments in markets and technology. These should be spelled out alongside the steps required to meet critical environmental targets on the timescale required. Multiple policy options should always be in the policy armoury assembled for a smart as well as a just transition. They must include both the means to assist and compensate where this is fair, reasonable and effective, and the capacity and willingness to regulate where this is necessary.

Measures to support a just transition must pay due regard to farmers as primary producers and land managers but also must take account of a broader spectrum of those potentially affected, including farm workers, rural communities, and workers in other parts of the food chain and consumers. The programme of interventions both within and outside the CAP should be part of a broader, balanced approach within the whole food system, aiming to meet critical targets while allocating a fair distribution of responsibilities, with support available in response to demonstrated need.

1. INTRODUCTION

The paper explores how the concept of just transition might apply to the agriculture sector and the land use that accompanies it[1] in the coming decade as Europe embarks on a period of far-reaching change, first signalled by the Green Deal. It is widely accepted that the transformations required to meet climate, biodiversity and other goals will have social and economic consequences and not everyone will be a winner, especially in the shorter term. Whilst it is early to predict exactly how the new generation of policies and market responses will work through the layers of Europe's food systems and the precise impact on the ground, it is not too soon to consider where costs might fall and how to bring fairness to a transition that is strongly in the interest of society as a whole.

This paper comprises 9 sections, beginning with a brief discussion of the transition concept and ending with policy proposals for the agriculture sector. Sections 2 and 3 seek respectively to explore and explain transition and just transition in general and to consider some potentially relevant lessons from other sectors, before turning specifically to just transition in the agriculture and land use sector in section 4. Section 5 explains the specific policy context for agriculture and section 6 teases out in more detail the nature of the required agricultural transition. This underpins a very preliminary attempt to broadly identify potential losers and winners in section 7. Section 8 spells out the interventions and changes to existing rural policy instruments which may be required in the EU both to support the transition in the sector and to pursue a just outcome. The final section offers some overall conclusions.

[1] Whilst the primary focus of the paper is on agriculture and the accompanying land use dynamics that are so closely coupled to farming, (especially in the context of Green Deal goals), the larger food system is equally part of the transition. In some cases we refer to this explicitly, in other cases it is more implied. Use of terms like "agriculture sector" is not always intended to refer only to farming.

2. TRANSITION

This is the word now most widely used to describe the transformations of major aspects of social, economic and cultural life necessary to mitigate the climate and biodiversity emergencies in particular[2].

These transitions require strong structural, technical and behavioural change in production, distribution and consumption in many sectors of the economy and society, particularly : energy systems, mobility, the food system and land use, and in domestic, industrial and commercial sector heating and cooling.

There is now well-established and accepted analysis that the results of *not* making these necessary transitions are catastrophic, with long-run costs far exceeding the likely costs of taking action to avoid the worst damage[3]. Particularly for climate and biodiversity there is general agreement that delaying transition implies higher long-run costs. It is therefore important always to bear in mind that impediments and delays caused by prospective losers of transitions will themselves impose burdens on society as a whole and thus injustice through the greater losses likely to be suffered by future generations. Such burdens will fall most on those least able to resist them in the poorest parts of the world and our societies.

[2] When considering specifically the food, agriculture and land use sectors there is growing agreement that diet and public health, and the issue of the threats to efficacy of antimicrobials (many of which are used in agriculture) are parallel societal challenges of a high order alongside climate and biodiversity, adding a further dimension to transformation in these sectors.

[3] A highly influential example is the Stern Review Final Report (Peters et al. (2006) *Stern Review: The Economics of Climate Change*. https://webarchive.nationalarchives.gov.uk/ukgwa/20100407172811/https:/www.hm-treasury.gov.uk/stern_review_report.htm). Two of its principal findings were that: "Using the results from formal economic models, the Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more. In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year. Whilst these figures have been much discussed and analysed, the overall conclusion that the costs of inaction exceed the costs of action has not been overturned. A comparable review of the economics of biodiversity was published by Dasgupta whose analysis did not attempt to quantify the relative costs of action and inaction. He did however include as one high level message, that "*Reversing these trends [in the destruction of biodiversity] requires action now. To do so would be significantly less costly than delay, and would help us to achieve wider societal goals, including addressing climate change (itself a major driver of biodiversity loss) and alleviating poverty.*"
(Dasguptan (2021). *The Economics of Biodiversity: The Dasgupta Review*.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962785/The_Economics_of_Biodiversity_The_Dasgupta_Review_Full_Report.pdf)

3. JUST TRANSITION

Usage of the concept has multiplied in Europe in the last decade, particularly in the context of climate change and the associated decarbonisation of the economy. However, it was in the US that first we find the origins of the concept of just transition[4]. Historically, it has been applied mainly to individual sectors or industries rather than to the whole economy. Much of the literature on the subject has been concerned with either the extractive industries, especially coal mining, or traditional manufacturing industries, including car production. Many earlier energy and manufacturing transitions associated with broader social progress are considered to have been unjust, with too much burden being carried by workers in declining industries and communities associated with them.

Much of the more recent writing on just transition has been developed by the trade union movement to encompass a range of social interventions needed to secure workers' rights and livelihoods when economies are shifting to sustainable production (primarily connected to combating climate change and protecting biodiversity).

The concept has acquired high-level political acceptance in international and supranational fora. It was included in the preamble of the 2015 UN Conference on Climate change (COP21)[5] which noted the need to (…) *[t]ak[e] into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities* (…)*"*. The 2015 United Nations Sustainable Development Goals[6] also represent the agenda for just transition, particularly in the goals for 'poverty eradication' (Goal 1), 'clean energy for all' (Goal 7), 'decent work for all' (Goal 8), and 'climate protection' (Goal 13).

A report produced for the OECD[7] has argued that "*[f]or most in the trade union movement, business and government, the International Labour Organisation (ILO) Guidelines provide the accepted definition of a just transition. The ILO's vision of just transition is broad and primarily positive. It is a bridge from where we are today to a future where all jobs are green and decent, poverty is eradicated, and communities are thriving and resilient. More precisely, it is a systemic and whole of*

[4] Pinker, A. (2020). *Just Transitions: a comparative perspective*. The James Hutton Institute & SEFARI Gateway. https://www.webarchive.org.uk/wayback/archive/20200908111136/http://www.gov.scot/publications/transitions-comparative-perspective/

[5] FCCC (2016). *Report of the Conference of the Parties on its twenty-first session, held in Paris 30/11 – 13/12 2015.* The Paris Agreement.https://unfccc.int/sites/default/files/resource/docs/2015/cop21/eng/10a01.pdf

[6] UN (2015) *The United Nations Sustainable Development Goals*. https://sdgs.un.org/goals

[7] Just Transition Center (2017), *Just Transition: A Report for the OECD*. https://www.oecd.org/environment/cc/g20-climate/collapsecontents/Just-Transition-Centre-report-just-transition.pdf

economy approach to sustainability. It includes both measures to reduce the impact of job losses and industry phase-out on workers and communities, and measures to produce new, green and decent jobs, sectors and healthy communities. It aims to address environmental, social and economic issues together." This represents general acceptance of the considerable widening of the term from the early usages by labour unions in North America who saw transition as the programs of support for workers who lost their jobs due to environmental legislation.

The principle of just transition has also been adopted by the European Union as an important dimension of the European Green Deal[8] in which all regions must make the transition to the greener economy. The Commission's announcement of the Green Deal was later accompanied by the proposal to mobilise at least €100bn as a central part of a just transition mechanism to help address "the social and economic effects of the transition focussing on the regions, industries and workers who will face greatest challenges"[9]. This proposed package of measures, including the now operational Just Transition Fund, was addressed 'to people and citizens, to companies and sectors and to Member States and regions'. In addition to specific measures to secure clean, affordable and secure energy, the envisaged package would include supports for: reskilling opportunities, housing, poverty alleviation, economic diversification, jobs, innovation and start-ups, technical assistance and connectivity. This spells out how just transition is now understood as a policy term in the EU. The focus of the Fund however is on regions and Member States with a high economic dependence on fossil fuel and carbon-intensive areas rather than rural areas.

A similarly broad interpretation of just transition has been adopted by the European Bank for Reconstruction and Development (EBRD). Its June 2020 paper[10] explained that "a just transition seeks to ensure that the substantial benefits of a green economy transition are shared widely, while also supporting those who stand to lose economically – be they countries, regions, industries, communities, workers or consumers. A rapid increase in the speed and scale of actions required to reduce the risks of climate change will create new economic opportunities. Whilst a just transition is mainly based on environmental considerations, it is also shaped by other structural changes affecting labour

[8] European Commission. (2019). *The European Green Deal sets out how to make Europe the first climate neutral continent by 2050, boosting the economy, improving peoples' health and quality of life, caring for nature and leaving no one behind.* https://ec.europa.eu/commission/presscorner/detail/en/ip_19_6691

[9] European Commission (2020) *The Just Transition Mechanism: making sure no one is left behind.* https://ec.europa.eu/commission/presscorner/detail/en/fs_20_39

[10] European Bank for Reconstruction and Developement (2020). *The EBRD just transition initiative.* https://www.ebrd.com/what-we-do/just-transition

markets, such as globalisation, labour-saving technologies and the shift to services".

In most discussions, just transition is concerned with the socio-economic aspects of incentivising transition to take place and assisting and compensating the losers. It is therefore mostly concerned with achieving fairness in the transition process both as a matter of principle and also partly in order that those hurt by change do not obstruct the necessary transition, thereby inflicting greater injustice on those hurt by unrestrained climate change and biodiversity loss.

Although there are long-term net social benefits from making these transitions, the actions required may impose significant short-run costs on certain groups in society. Additionally, apart from normal inertia and reluctance to change, there is often opposition to proposed transition not only from groups who are almost certain to be losers but also from other affected groups who may not understand or believe the threats to their long-term climate and environmental security.

Coupled with the depth of change required, the uneven distribution of impacts over time and across social groups signals that successful transition may demand justice i.e., fair treatment of those whose interests are hurt, or perceived to be hurt, by change. This has not always occurred historically and the resentments, societal breakdowns and unwillingness to co-operate with future change of those who have been left behind have left scars. Many examples of unjust transitions have been observed, some arose as a result of unaddressed grievances caused by the effects of technological change (such as in power generation, mobility and communications), some by the effects of policy change (for example for pollution control). These can result in unemployment and severe economic hardship which is often concentrated in local communities unable to cope with the speed and scale of change. There is a strong case for greater recognition of the importance of just transition in the case of the need for large-scale GHG emission reductions over a relatively short period. Failure to sufficiently meet the challenge of ensuring the transition is just risks impeding the transition itself.

A recent World Resources Institute report[11] identified four key lessons for a just transition. First, it is possible. Second, social dialogue is essential. Third, just transition strategies must focus on entire communities not just workers—bearing in mind that most examples are drawn from industrial and infrastructure changes. Most of the writing on just transition has focussed on the energy and transport sectors, and accordingly the fourth lesson was that large clean energy projects

[11] Lazer, L. (2021). *A Just Transition to a Zero-carbon World is Possible, Here's How.* World Resource Institute https://www.wri.org/insights/just-transition-zero-carbon-world-possible-heres-how

are not always equitable by default and that past experiences are key to designing a just transition.

4. JUST TRANSITION IN THE EUROPEAN AGRICULTURE AND LAND USE SECTOR

At a general conceptual level, it is increasingly clear that a distinctive transition will be required in agriculture in the coming decades. The need to meet targets for emissions reductions is the most evidently pressing driver for change but there are several others, including the escalating concern about dietary health and the need to reverse the loss of biodiversity. This is of special relevance to agriculture because of its dominance of land use in many countries and the damaging impacts of intensification of both cropland and grasslands. Alongside these environmental drivers there is the need to improve working conditions in a sector where these are often too low. Some sectors, such as meat and dairy production, could be particularly affected. The socio-economic implications may not yet be entirely clear but thinking about a just transition for food and agriculture has begun, at a global scale as well as within Europe. One example is the principles proposed by the NGO Action Aid in a recent publication[12].

Up to now there has been relatively little explicit discussion of just transition in agriculture and the broader agri-food system in Europe. However, the literature is starting to grow with one notable example being the recent work by IDDRI[13,14], whose March 2021 report considered the implications of an ambitious scenario for increasing sustainability, changing diets and retaining food export capacity in Europe. An accompanying report, focused on agricultural transition in France, argues for a pathway that maintains current employment in the agriculture sector as well as meeting ambitious environmental and health targets. Another example is the approach being developed in Scotland, under its Just Transition Commission, which is an integral part of the Scottish Government's commitment to achieve Net Zero by 2045[15]. Amongst many recommendations, the Commission proposes that the Government should establish a Just Transition Plan for Scotland's land and agriculture and include clear milestones out to 2045.

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[12] Anderson, T., (2019). *Principles for a Just Transition in Agriculture.* Action Aid. https://actionaid.org/sites/default/files/publications/Principles%20for%20just%20transition%20in%20agriculture.pdf

[13] Poux, X. and Aubert, P-M. (2018) *An agroecological Europe in 2050: multifunctional agriculture for healthy eating.* IDDRI. https://www.iddri.org/en/publications-and-events/study/agroecological-europe-2050-multifunctional-agriculture-healthy-eating

[14] Aubert, P.-M., Gardin, B., Aillot, C., (2021*). Towards a just transition of food systems. Challenges and policy levers for France.* IDDRI. https://www.iddri.org/en/publications-and-events/report/towards-just-transition-food-systems-challenges-and-policy-levers

[15] The Scottish Just Transition Commission was announced in late 2018, convened in 2019 and has produced a number of reports advising the Scottish Government on what just transition entails for all sectors of the economy, including the food and land-based sectors.
Scottish Government (2021). *Just Transtion Commission : A National Mission for a Fairer Greener Scotland.* https://www.gov.scot/publications/transition-commission-national-mission-fairer-greener-scotland/

Early engagement with the farming community is a prominent theme and Scottish farmers are being engaged in initiatives to determine how the sector will manage to respond to this challenge, not least in the sizeable beef and dairy sectors.

It is in the Netherlands however that some of the central issues of the transition and the best ways of achieving it are being brought most sharply into focus. Efforts to resolve a long running problem of excessive levels of Nitrogen and environmentally damaging ammonia emissions derived from the particularly heavy concentration of intensively managed livestock in the Netherlands have been underway for many years. The Farm to Fork strategy will have been an additional pressure to move forward. At the time of writing the new coalition government had just published a paper on how it intends to address this issue and the broader question of agricultural transition, proposing a "National Programme for Rural Areas". This will involve achieving targets for nature restoration, climate and water quality, including a reduction of 50% in nitrogen use by 2030[16]. Significant cuts in livestock numbers are envisaged alongside technological approaches to reducing emissions. Sizeable funds are to be spent on compensating farmers, some of whom are expected to cease production. Expenditure of Euro 25 billion in the period up to 2035 is proposed for the programme as a whole, to be spent in the framework of an agreement with the provinces. It is early days to consider the wider implications of the Dutch experience. However, at this point it seems to underline the need. for governments to engage early, be clear about the targets to be reached and to be ready to negotiate significant expenditure within a governance framework that wins the trust of the key players. It also highlights the value of a concerted EU approach in a number of areas. If production is simply shifted from one Member State to another, some important local pressures will be reduced but many of the underlying sustainability goals for Europe will not be addressed.

Despite these early examples, the overall progress to date in elaborating what just transition for agriculture means in Europe has been limited. This is not simply because of a lack of appreciation that agriculture will need to play a part in responding to changing environmental and social requirements. At least in the EU, the hesitancy stems partly from questions about exactly what those requirements will be, both in the decade to 2030 and in the years ahead, and partly from how to incentivise the necessary actions. The policies that are intended to drive the transition in the EU and some of their implications are reviewed further in Section 5 below.

16 Agra Facts No.105-21 19/11/2021 (coalition agreement available in Dutch).

However, before considering these it is useful to explore those attributes of agriculture and associated land use that make it rather a special case and distinguish it from the energy, manufacturing and mining sectors which are the focus of much of the just transition literature. In brief these are:

- The sensitivity of agriculture as a strategic element of the economy and key component of secure food supplies. Possible changes in levels of food supply and prices, import dependency, employment levels, farm incomes and long-established local production systems are highly sensitive in political terms. The resistance to changes in the EU's Common Agricultural Policy (CAP) seen in the reform debate underway since 2018 underlines the continuing political potency of the agricultural establishment to defend sectoral interests.

- Farms, farmers and farm workers are also distributed over large areas in Europe, far from being concentrated in specific regions and political constituencies as occurs for many manufacturing and mining activities.

- Changes in agriculture have much larger potential to affect land use than those in other sectors, with implications for many aspects of the environment such as, soil health, water quality, carbon sequestration and the space available for nature and forestry.

- A very large number of people are employed directly or indirectly in agriculture or derive some income from farming or rural land ownership in Europe, even though the number employed full-time and earning a living wage in the sector is declining. This is an exceptionally complex picture with a great range of farms from the highly industrialised poultry units to the smallest part time holdings the size of large gardens, all gathered under the umbrella of farming. There are also significant numbers of casual, seasonal and sometimes poorly documented workers on certain farms in labour-intensive sectors such as fruit and vegetables. Working conditions can be poor and incomes in most parts of the agriculture sector are not high. Working through and addressing the implications of change for such an extensive and diverse community is challenging.

- The dominance of small-scale, self-employed, family-based producers compared to other sectors can make it more challenging to induce changes through new policies, to monitor results and be certain of outcomes. Employment mobility in and out of the sector is not high in most areas.

- Because of the diversity of soils, climate, topography and agricultural ecosystems, there is a wide variety of farming and land management systems in Europe. These are managed by a large number of mostly micro businesses

who will therefore find multiple transition paths in the primary production sector. These businesses manage considerable biological and weather variability and thus business uncertainty. Structural change is generally slow and the unique character and very slow turnover, in the agricultural land market marks it out from other sectors.

- Furthermore, farmers are mostly small businesses embedded in food supply chains that include sophisticated, often multinational, large companies up-stream and downstream of primary production. These strongly influence production systems and consumption and prices in the food chain. This sector could mediate or obstruct transition and therefore it is unavoidable that they will play a significant role in transition alongside actions taken within farms. Ensuring that this role assists rather than inhibits the transition is a key consideration.

If these features make the agriculture sector rather distinctive it suggests that some of the considerations which arise for a just transition may be different from the economy as a whole or for the sectors for which the term was originally coined. Some apparent differences are summarised in Table 1 below.

Table 1: Just transition for traditional mining/extractive industries and the food and farming sector

Considerations for a Just Transition	The extractive and declining industries	Food and farming sector
Scale and nature of businesses	Often large companies (some in public ownership), generally with large workforce	Mainly small and micro family businesses, few employees, often owning assets of value (less so for tenants)
Principal threat	Redundancies and complete shutdowns, challenge of major restructuring of local economy	Change of business operation, income loss, market disruptions, redundancies only in specific cases (e.g. extensive pastoral farms)
Decision makers driving transition	Government policy and company executives	Government policy and some consumer behaviour change (animal to plant-based diets), retail and food companies
Other drivers for change	New technology creating obsolescence, contributing to general economic and social good	Aim of reducing damage to climate and natural capital including farmers' own soils and directing more resources to public benefit. Technical change also.
Degree of spatial concentration	Highly concentrated, economically, socially and often geographically	Highly diffuse over the whole territory, but with some specific regional threats
Principal JT question	How to compensate the losers, engagement/consultation	How to arrive at fair outcome and also induce transition

Another notable aspect of the transition envisaged in the agriculture and wider food system is the sheer breadth and complexity of the interlocking changes required, far beyond the substitution of a few key technologies with greener alternatives. Even at the farm level alone there is a multiplicity of technological, management and system choices and alterations in output that may be involved. These observations suggest that the kinds of actions we would expect to see to ensure a just transition for agriculture may go beyond and be somewhat different to the classical instruments for just transition namely: financial redundancy payments, retraining and skilling, regional investment strategies and efforts to increase the mobility of the workforce.

The choice of policy tools and intervention strategies will depend also on the precise goals being pursued. This may not be completely self-evident, especially given the complexity of the transition required. For example, in terms of justice, given a goal of maintaining prosperity and good working conditions for the sets of people and wider rural communities now involved in agriculture, to what extent are we concerned if employment shifts into more diverse activities which fit new models of activity, while being reduced in agriculture itself? New jobs would be created in rural areas but not necessarily in exactly the same locations as existing ones. There are different perspectives on such questions.

One pioneering example of setting long term goals for the sector is the recent IDDRI report setting out exploratory scenarios for France. It does not put forward a rigorous definition of just transition for agriculture and the food chain. However, in broad terms it suggests that the transition "must be socially *just*, from producer to consumer, i.e. it must ensure that jobs and income are maintained for those involved in the sector while guaranteeing access to food for all; it must ensure that this food is *healthy*; and finally, it must play its part in conserving and restoring biodiversity – that which is contained within agro-ecosystems and also that of uncultivated areas"[17].

This sets the bar high in terms of retained employment if the "sector" is defined as agriculture as it is today. It is far from clear that just transition implies that *all* existing jobs in all farming sectors must be maintained along with agricultural incomes. Given experience in this and other sectors of the economy, with a continuous turnover of people this seems unrealistic.

Protecting the current scale of employment in farming or minimising losses is a legitimate priority for many organisations but it is a different and narrower goal than achieving a just transition. This illustrates one reason why greater clarity is

[17] Aubert et al (2021), op cit.

needed about what a good outcome would be and how it might be achieved. Competing but credible studies, scenarios and models have a potentially important role in increasing consensus.

In considering further what form a transition might take and the implications that could flow from it, a first step is to consider the principal policy drivers within the EU.

5. THE POLICY CONTEXT FOR AGRICULTURAL TRANSITION

The transition of interest here is that towards greater sustainability and closer integration with dietary health in the food and agricultural system as a whole. It is being driven to a considerable extent by an interlinked set of policy changes being introduced at the European level. Most fall within the umbrella of the Green Deal and several include targets for 2030. Some of the main initiatives are outlined briefly below. They need to be considered alongside other drivers such as national policies, changes in consumer preferences and food habits, the direction being taken by food companies and retailers, a range of emerging technologies and developments in Europe's trading partners.

Accompanying these new EU policy drivers is a second major arm of EU intervention, the long-established CAP, entering its most recent phase in the period from 2023 to 2027. This is the prime source of financial support for agriculture and related land management activities in Europe but has a less certain role in relation to the transition. It offers several defined channels for funnelling support to farmers which could be used directly to aid the transition process, as the European Commission frequently emphasises. However, it is not yet clear precisely how Member States will choose to use these policy tools in the coming decade and how far they will either promote transition or target measures to soften any adverse impacts of it.

In this Section these two major arms of policy are reviewed briefly in turn and the relationship between them considered.

Since the Green Deal was first launched by the European Commission in December 2019 there has been a flow of proposals emerging with a direct impact on the agricultural, land use and wider food sectors. These include a group of strategic policy drivers, aiming for a significant transition by 2030, notably the Farm to Fork Strategy, the Biodiversity Strategy and a range of climate policy measures adopted in July 2021 under the "Fit for 55" package. Many of the more specific legislative proposals expected within these frameworks have yet to be fully developed or adopted formally but they are being rolled out step-by-step. In 2022 for example, proposals from the Commission are expected on revising the current pesticide regulations (notably the Sustainable Use Directive) with the aim of reducing the use and level of risk associated with pesticides by 50% by 2030.

In addition to the overall commitment to a Green Deal, the key measures with a direct bearing on the agri-food sector include:

- The EU's commitment to Net Zero Greenhouse Gas emissions by 2050. The most recent concrete proposals were put on the table by the European Commission in July 2021. This is a package of measures to reduce net emissions by 55% by 2030, looking towards a "fair, green and prosperous future". It includes new and more ambitious emission reduction targets for the Member States under the Effort Sharing Regulation, which includes the agriculture sector; by 2030 GHG emissions are to fall by 40% against a 2005 baseline. Renewable energy targets are increased with implications for rural land use in some areas. A new regulation on land use forestry and agriculture[18] sets an overall EU target for carbon removals by natural sinks, equivalent to 310 million tonnes of CO2 emissions by 2030. National targets will require Member States to care for and expand their carbon sinks to meet this overall target. From 2031 onwards there will be a single land pillar in accounting terms, combining agricultural emissions with sinks with the aim that by 2035, the EU should reach climate neutrality in the land use, forestry and agriculture sectors. This will include non-CO2 emissions arising from agriculture, such as those from fertiliser use and livestock. Further measures may well follow given the scale of the challenge of meeting the net zero target by 2050 as emphasised by COP26 in Glasgow.

- The Farm to Fork Strategy[19] has the general aim of making food systems in the EU fair, healthy and more environmentally sustainable. It sets out 27 main initiatives, some of which are regulatory, others not. Between them they address all the main components of the food chain including primary production, processing, distribution, consumption and food waste. Key 2030 targets for agriculture include cutting nutrient losses by 50%, reducing fertiliser use by 20% and reducing the use of antimicrobials by 50%, along with halving food waste by 2030, which would have implications for food supply as well as resource use and environmental costs. Further, an Organic Action Plan[20] has been launched to increase the share of organic products in the market, with the target that 25% of the EU utilised agricultural area will be

[18] European Commission (2021). *Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review*, COM/2021/554 final.
https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52021PC0554

[19] European Commisison (2021). *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*. COM (2020) 381 final. https://ec.europa.eu/transparency/documents-register/detail?ref=COM(2020)381&lang=en

[20] European Commission. (2021). *Communication from the Commission to the European Parliament, the Council, the European economic and social committee and the committee of the regions on an action plan for the development of organic production*. COM/2021/141 final/2.
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29

farmed organically by 2030. Amongst other proposals also in the pipeline is a Sustainable Food System Framework initiative[21]. This could lead to a legislative proposal in 2023 designed to increase sustainability right through the food chain bringing the production and consumption sides together[22]. Food labelling, public procurement and revised animal welfare legislation are also amongst the specific topics to be addressed by the Strategy. Some measures are intended to create new economic incentives for change by land managers, over and above those embodied already in the CAP. Their potential impact is difficult to assess at this point but might become clearer when the Commission publishes its proposal for an EU regulatory framework for the certification of carbon removals (central to the "Carbon Farming Initiative"), currently expected before the end of 2022.

- The Biodiversity Strategy[23], published in May 2020, aims to put Europe's biodiversity "on the path to recovery" by 2030. One of the key proposals is to establish an expanded EU-wide network of protected areas on land and at sea, enlarging existing Natura 2000 areas, with strict protection for areas of very high biodiversity and climate value. An EU nature restoration plan will include concrete commitments, many impinging on agriculture, such as restoring degraded ecosystems by 2030 and managing them sustainably. As part of this, the Commission is due to propose binding nature restoration targets in the first half of 2022. Finally, there is a target in the Strategy for high-diversity landscape features to account for 10% of the agricultural land area by 2030.

- The newly proposed EU Forest Strategy aims to improve the quality, quantity and resilience of EU forests, including the sustainability of harvesting, while setting out a plan to plant three billion trees across Europe by 2030.

- An EU Soil Strategy with suggested future legislative proposals was published by the Commission in November 2021; its main provisions and possible binding legislative targets concerned restoration of organic and peat soils, land take, soil-sealing and soil contamination.

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[21] European Commission (2021). *Sustainable EU food system –new initiative.* https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13174-Sustainable-EU-food-system-new-initiative_en

[22] Some of the challenges that this Framework would tackle and proposals on the ways in which this could be achieved are set out in Baldock, D. and K. Hart (2021). *Pathways towards a legislative framework for sustainable food systems in the EU.* Institute for European Environmental Policy. https://ieep.eu/publications/agriculture-and-land-management/pathways-towards-a-legislative-framework-for-sustainable-food-systems-in-the-eu

[23] European Commission (2020) *Communication from the Commission to the European Parliament, the Council, the European economic and social Committee and the committee of the regions : Eu biodiversity strategy for 2030 - Bringing nature back into our lives.* COM (2020) 380 final. https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF

Further regulations and initiatives envisaged within these strategies and impinging on agriculture will be proposed in the coming years. In addition, some are likely to arise outside these strategies. For example, in October 2021 the European Parliament voted in favour of the adoption of binding emission reduction targets for all the economic sectors responsible for methane emissions in the EU. According to EEA data, around 53% of EU methane emissions stem from the agriculture sector[24]. Another example is the significant decision to end the use of cages in EU livestock production by 2027, with legislation expected by 2023.

Flanking these drivers are other policies that seek to relieve some of the economic pressures on farmers. These include measures to strengthen the position of farmers in the food supply chain and the EU Code of Conduct on Responsible Food business and Marketing Practices, launched in July 2021.

Turning to the Common Agricultural Policy (CAP) there is a considerable history of efforts to confront, evade or support transitions of various kinds. The CAP came into being in the late 1950s in response to the creation of a common market and customs union which was to include agriculture. In many respects agriculture was transformed in the two decades that followed, technologically, economically and socially. The CAP helped to temper the impact of a swathe of structural change that saw more than 10 million people leave agriculture between 1958 and 1979[25]. It also played an important role in adjusting to the consequences of the major expansion of the EU to Central and Eastern Europe following the fall of the Berlin Wall. Managing transition has always been seen as part of the core rationale of the CAP, even if this language was not always explicitly used. In principle this creates opportunities to develop and adapt support policies where needed rather than starting completely from scratch.

However, at present there is tension between the inclination of many Member States and farming organisations to continue to use the CAP as a funding vehicle to support agriculture with relatively little incentive to change and on the other hand the demands of the Green Deal and wider society, looking to link continued public support to the sustainability transition. This is not the first time that ambitious reform has been resisted by Member States. It occurred at the birth of the CAP and again in the 1990s, as recounted in Box 1.

The challenge is to ensure that history does not repeat itself and that the new climate, biodiversity and health-driven emphasis on transition is now fully

[24] AgraFacts 86-21, 22 October 2021.
[25] European Commission (1980), *Reflections on the Common Agricultural Policy*. COM (80) 800 finalEC Bulletin, Supplement 6/80, Brussels. http://aei.pitt.edu/1361/

integrated into the CAP and the policies applied under it. This should be an achievable task but it faces a number of barriers. One is that the current CAP is based on proposals from the last Commission presented in 2018 prior to the adoption of the Green Deal. This has less ambitious objectives in mind. The legislative process for this latest CAP reform concluded in June 2021 without significant strengthening of the measures that would have aligned it more closely to the Green Deal. Its provisions will steer agriculture for the duration of the current financial framework until the end of 2027. Therefore, the way it is implemented in the Member states is critical, including the extent to which they adapt it over time as the regulations permit.

The objectives set in this latest edition of the CAP are to foster a smart, resilient and diversified agricultural sector, ensuring food security, bolstered environmental care and climate action plan and reinforcing the socio-economic fabric of rural areas. This ambition translates into nine specific objectives, three for each sustainability dimension, economic, environment and social. The two-pillar structure of the CAP, which dates back to the Agenda 2000 reform is unchanged: Pillar 1 occupying approximately 75% of the budget resources contains the 100% EU financed direct payments plus residual market supports, and Pillar 2 comprises the co-financed rural development regulation including, inter alia, support for agri-environment and help for areas under natural constraints. The principal innovations in the latest reform are so-called enhanced conditionality attached to the payments to farmers, the new voluntary-for-farmers eco-scheme set up in Pillar 1 to encourage higher standards of environmental management on farms, and a new decentralised delivery model. The new governance structure requires each Member State to define a CAP Strategic Plan based on their assessment of needs (economic, social and environmental), showing how they propose to use the funds and instruments of the CAP to address these needs and help to achieve the agreed objectives of the CAP. The Commission must approve these plans before they can be put into operation.

Box 1: Addressing transition and ambition in the CAP

The CAP was seen at the creation of the European Communities in the Treaty of Rome[26] as a critical element of the economic, social and political integration of the founding countries. Although the term just transition was not used at that time, the shapers of the Treaty believed that a common agricultural policy was necessary first to ensure fair terms of trade for agricultural products across the countries creating this common market, and also to help an economically relatively backward sector modernise and develop – in current parlance to make a transition. It was quite explicit in the Article 39 objectives of the CAP that its aim was "(a) to increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of factors of production in particular labour," and "(b) thus to ensure a fair standard of living for the agricultural community."

The debates of the time are analysed in detail by Tracy[27] who observed that these objectives "suggested a preference for structural measures rather than overall price support, but in subsequent practice not much attention was paid to these nuances". In the event, the development of the CAP was a prolonged process taking well over a decade after the Rome Treaty was signed. A critical step on the way was the Mansholt plan proposed in 1968 by the first Commissioner for agriculture which quite explicitly recommended that market policy should be balanced by strong structural policy to help create viable, generally larger, production units using retraining and retirement schemes. In the event the political settlement resulted in a CAP dominated by market policies embodying a high level of protection. What we might term the transition measures were downplayed at the outset.

This set the scene for the development of EU agriculture from the 1960s to the 1990s. Eventually the budgetary and international political costs of this policy arising from the accumulation of large surpluses which were exported with substantial market-disrupting subsidies, brought about a transformation of the policy starting in 1995. This switched the CAP from

[26] Treaties establishing the European Communities (1973 edition), Luxembourg.
[27] Tracy, M. (1989) *Government and Agriculture in Western Europe 1880-1988*, 3rd edition, Harvester Wheatsheaf, London. Chapter 12: The formation of the Common Agricultural Policy.

indirect market price support to direct compensatory payments to farmers, a structure largely remaining in place today.

At an early stage of this direction change in the CAP it was proposed that direct payments to farmers should be transitional, and indeed called 'transitional adjustment assistance' to help farmers adapt their businesses to the new circumstances in which the importance of environmental performance was seen as critically important. This proposal did not appeal to Member States and unfortunately, it became yet another side-lined suggestion[28] on how to use the CAP to assist a necessary transition in agriculture.

The gap between the provisions of the new CAP and what is required to support the Green Deal objectives has been examined in a number of studies as well as the critiques of think tanks and NGOs. One of the first of these was conducted prior to the end of the political negotiations over the CAP legislative texts and published by the European Parliament in November 2020[29]. The texts analysed were similar to those that emerged from the Trialogue process in June 2021. The key findings include that:

- "EU agriculture and food practices are currently not on the right track to meet the Green Deal ambition, objectives and quantitative targets related to climate, environment, nutrition and health issues in that sector."

- "To reverse these unfavourable trends, there is an urgent need to significantly strengthen many technical provisions of the CAP; in particular those related to conditionality requirements and eco-scheme measures, and those to improve the CAP governance, notably by making the attainment of targets legally binding and improving their enforcement, reporting and monitoring."

In principle, the imperfect CAP measures now in place and their attached funds still provide the opportunity to assist farmers through a period of change, whether or not Member States choose to align the payments they make explicitly to the obligations due to materialise as the Farm to Fork Strategy, the Biodiversity Strategy and other measures come into effect. In practice, given the

[28] European Commission (1997) *European Economy : Towards a common agricultural and rural policy for Europe*. Reports and Studies No 5.
[29] Guyomard, H., Bureau J.-C. et al. (2020) .*The Green Deal and the CAP: policy implications to adapt farming practices and to preserve the EU's natural resources*. European Parliament, Policy Department for Structural and Cohesion Policies, Brussels, p.13. https://www.europarl.europa.eu/RegData/etudes/STUD/2020/629214/IPOL_STU(2020)629214_EN.pdf

decentralisation of decision making to Member States at the heart of the New Delivery Model, much now depends on the design and delivery of the CAP Strategic Plans presented by the end of 2021 for Commission approval. Some Member States may be ambitious while others choose to tune payments more closely to established policy instruments and the maintenance of farm incomes from traditional sources rather than pursue a more sustainable model. The ability of the Commission to exert strong leverage on the plans has yet to be tested.

This current set of CAP mechanisms is a long way from a specifically tailored just transition plan for agriculture. However, it represents a source of sizeable and relatively flexible support for the farm sector, based mainly on EU funds. This does not apply to most other parts of the economy facing transition. The critical question is how these funds will be used.

This is not to trivialise the potential impacts of transition on the sector, as discussed in Section 6 below, or to overlook the limitations of the CAP, particularly in relation to protection from imports. If domestic producers become subject to greater environmental constraints they may become more vulnerable to increasing competitive pressures from overseas suppliers in countries that do not impose equivalent environmental and animal welfare requirements on their farmers. Countries exporting to the EU may be able to obtain competitive advantage if they operate with lower standards than in the EU, for example in relation to pesticide and fertiliser use, to GHG emissions and to rising EU standards of farm animal welfare. While some EU manufacturing sectors, such as fertiliser producers, might be able to expect protection from import competition via the proposed Carbon Border Adjustment Tax[30], such a mechanism to level the playing field is not envisaged for the agriculture sector, at least in the near term.

This brief overview of the current policy context leads to the conclusion that the CAP has not yet been fully aligned with the logic of the Green Deal and just transition. Some of the ingredients may be present, not least the sizeable budget for the CAP, but further initiatives are necessary and given consideration in Section 6 below.

[30] The manufacture of nitrogenous fertiliser (ammonium nitrate) is highly energy intensive, relying on natural gas both to supply energy and hydrogen. The sector is included in the EU Emissions Trading Scheme. Alongside other energy intensive industries, it argues that it must be assisted by level playing field adjustments to avoid carbon leakage if the ETS is tightened in comparison to competing countries. This could be through some form of carbon border adjustment mechanism. The complexities, diffuseness and fragmentation of farming make it highly unlikely that such a mechanism could apply to agriculture.

6. WHAT KIND OF TRANSITION IS ENVISAGED?

Given the policy background sketched above and the intention to introduce further legislation, including a new basic food law for the EU by around 2023, it is possible to set out some of the components of the agricultural and land use transition expected, taking a timescale from the present to around 2050.

For the moment this can only be offered in a broad-brush way as the specifics of agricultural transition are much less clear cut than either the decarbonising of power generation or the changes in vehicles and modes in the transport sector, both of which have attracted much debate and intervention. This is not only because the legislation is still taking shape and aspects of it are contested. It is also more complex and at an earlier stage of formulation.

First, the environmental transition directly concerns biodiversity as well as climate change and is accompanied by issues relating to soil and water management, the use of antimicrobials, animal welfare and other concerns.

Second, there are important interactions between agriculture and the other major land uses: forestry, nature, recreation, bioenergy and peat management. Goals and requirements in these sectors are developing as well and need to be taken into account.

Third, there is no clear consensus on the exact practices, technologies, systems and production mixes that will be required in agriculture. For example, it is not yet possible to specify an obvious and integral displacement of current technologies by a set of specific new technologies which are generally agreed to be required to provide a solution for emission reductions in the agri-food sector. There are still competing ideas about the relative roles of land sharing and land sparing strategies, about the extent to which agroecological, regenerative, organic and High Nature Value farming systems will be deployed and the degree to which livestock numbers should fall, trade levels adjust and whether production should migrate within Europe to the most ecologically beneficial locations. In contrast, for power generation there is general acceptance that the solution is some combination of renewables such as wind, solar, bioenergy (subject to strict sustainability requirements).

Fourth, in the food sector as outlined above, there is a strong additional and interacting diet and health crisis which means changes in food consumption must be part of the transition. Food consumption preferences and habits are considerably more complex and culturally determined compared to consumption of energy and transport.

Fifth, there are distinctive characteristics of agriculture and land use, outlined earlier, that have implications for the nature of the transition. These include the diversity of the sector and the fact that it is dominated by small producers most of whom have strictly limited resources and some of whom are not necessarily driven by short-term business logic. Lifestyle, asset management concerns and longer-term family preferences can play a bigger part in decisions than in many other commercial enterprises. Producers control most of the land base and since there is little turnover of land from year to year there are barriers to entry for new players and an urgent need either to induce change in the behaviour of incumbents or to increase the rate of structural change. Or both.

Two additional and rather specific complicating factors are worth emphasising:

- It is necessary to determine the safe operating space for livestock in the food system[31,32]. This is critical because livestock production dominates land use in global agriculture, including large areas in Europe and because of the intrinsic inefficiency of livestock feed conversion and the leakiness of livestock systems. These lead to water and air pollution, and significant GHG emissions. Furthermore, healthy diets almost invariably are defined as including lower levels of livestock products than those consumed today in Europe.

- As noted above, the danger of "leakage" has to be avoided. This is not unique to agriculture but could arise if imports of food into the EU that have been produced to lower environmental standards displace domestic production and so the environmental footprint in terms of GHG emissions and biodiversity damage for example is transferred abroad. This would be not only a backward step environmentally but also would be unfair on EU farmers and workers facing competitive pressures created by uneven regulatory requirements. It would be a failure to maintain a level playing field and counter measures might well be required, which might include increased regulatory standards applied to imports to assure sustainability or a form of carbon tax for example. For this reason, potential trade measures fall within the scope of an overall plan to achieve just transition in agriculture.

Accepting these uncertainties and complexities as well as the variations in the way in which the transition will affect different farms, it is nevertheless possible to sketch the type of changes that can be expected, assuming that the current EU

[31] The health and environmental issues surrounding livestock products are examined in detail in the report of the Eat Lancet Commission on a Healthy diet from sustainable food systems (Willett et al. (2019) *Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems.* https://eatforum.org/eat-lancet-commission/eat-lancet-commission-summary-report/). A consideration of the specific challenges of the livestock sector is found in.

[32] Buckwell, A. and Nadeu, E. (2018). *What is the Safe Operating Space for EU Livestock?* RISE Foundation, Brussels. https://risefoundation.eu/wp-content/uploads/2020/07/2018_RISE_Livestock_Full.pdf

policy strategies are implemented by the Member States, with effective policies for delivery on the ground being put in place. At least four major strands can be identified:

1. Changes in the overall composition and quantity of food being produced, alongside changes in consumption patterns, including a different balance between crop and livestock products. Assuming no change in current scientific advice and in policy direction it is likely that reductions in livestock numbers will occur in response to a combination of changing dietary preferences, social, cultural and media influences, more pronounced action by health bodies, food chain adjustments, new policy measures and the land use changes indicated in 2 and 3 below[33]. At the same time there could be increases in production of some protein and nitrogen fixing crops and of vegetables and fruit.

2. A reduction in the allocation of land to agriculture allowing a greater area for transition priorities, notably carbon sequestration in forests and peatlands and biodiversity restoration. This is expected to be driven by a combination of legislation and associated targets, new carbon and ecosystem service markets, more generous incentives and economic pressures such as the declining profitability of livestock in a number of more marginal areas, now mainly managed as pasture. Larger scale peatland restoration will have some impacts on traditional livestock systems in parts of Europe. Peat restoration in lowland peat areas, some currently in intensive vegetable production, is desirable but will be an area of particular challenge, where compensatory payments could play an important role. There may be future income-yielding management options but output of conventionally grown crops may have to fall. These changes will occur alongside other more mixed forms of land use such as agroforestry. Some degree of reintegration of livestock into what have become specialised arable areas would assist with meeting many environmental goals.

3. Changes in the mix of farming systems and accompanying practices will be part of the transition. This will give rise to a new balance of systems spanning quite different levels of intensity of cultivation. It will range from organic farming and agroecology at the extensive end of the spectrum to

[33] The balance between consumption and production changes especially for the livestock sector are hard to project as they are dependent on policies implemented and the responses of consumers and producers. Scenarios are possible where EU consumption falls more than production and export surpluses can find markets on other continents.

contained, vertical cropping systems and cell culture at the intensive end[34]. Significant additional uptake of more extensive, nature-based, production systems such as regenerative and organic farming and agroecology which aim, *inter alia*, to restore soil ecosystem functioning, can be expected. At the same time there will be an important role for some continued higher yielding systems which deploy data driven, precision farming and other techniques designed to reduce mineral fertiliser and agrochemical inputs and their negative environmental effects. Amongst changes in arable practice will be longer and wider rotations with greater diversity in crops and deployment of cover and companion crops. The pesticide reduction targets will accentuate the need to adopt new methods of pest and disease control on many farms and is likely to affect the choice of crops, potentially reducing the area of oilseed rape for example. There will be parallel changes in livestock management, including improvements in nutrient and waste management to reduce GHG emissions as well as water and air pollution and replacement of some of the most intensive indoor systems to comply with the decision to phase-out the use of cages and improve animal welfare in other ways. Further adjustments will be needed to reduce antibiotic use on livestock farms. The extent to which individual farms are able or willing to make such changes of these kinds clearly will be variable.

4. A systematic focus on reducing both carbon and non-carbon GHG emissions, energy use, curtailing waste and increasing recycling in the primary production sector. This will be linked to a stronger emphasis on improved resource management in agriculture, including more intensive use of data, focus on monitoring, measuring and auditing, with greater uptake of precision systems, reductions in energy and input use where possible. There is likely to be associated mechanisation and a continued shift to larger scale operations in certain contexts but also smaller and more efficient machines and shared equipment in some settings. The pursuit of efficiency and lower emissions will drive developments in livestock breeding and feed regimes, alternative approaches to nitrogen and pesticide management, reduced soil disturbance and cultivation, rationalised grazing regimes, and more attention to building soil carbon, especially if there are new incentives to do so. Smaller changes to farm management of many kinds will accompany larger, more structural, developments aiming to raise or maintain incomes as well as reduce emissions.

[34] The terms intensive and extensive as they relate to agriculture refer to the ratio of applied inputs and outputs per hectare of land, as land is seen as the ultimate finite, scarce resource.

Various policy interventions, including a combination of regulation, incentives, advice and aid for technological innovation, will need to be deployed to help steer the transition but not necessarily in the same way by different Member States. Farming organisations naturally will push for the maximum level of incentives but it must be remembered that just transition involves a fair distribution of responsibilities, including compliance with regulation and application of the polluter pays principle. Farmers and landowners have an interest in preserving their own resources and a responsibility to contribute to wider environmental and social objectives. At the moment change is occurring too slowly and further pressure from governments to convert Green Deal goals into specific obligations on the ground will be needed. This will require regulation and a sufficient commitment to enforce it. Striking the smartest balance between regulation and incentives will be key to delivering a just transition.

Beyond the agriculture and land use sector the transition will involve changes in other parts of the food chain, not least significant adjustment by consumers. Changes on the demand side could be driven by a combination of evolving consumer preferences and a diversity of policy initiatives, including: public procurement, welfare schemes for consumers[35], intensified information and education, and regulatory-driven developments in the food and retail sectors such as on food formulation, and also food taxes, for example for sugar. Commercial developments may also drive change where companies adopt relatively demanding decarbonisation and sustainability targets of their own.

There is wide agreement on the broad nature of the dietary changes which would be beneficial, namely: a switch in emphasis between plant and animal-based protein, more dietary fibre via fruit and vegetables, less sugary, salty and ultra-processed food. However, it is less clear how far policies will be introduced to influence dietary shifts in this direction. Some Member States already are active on this front and the publication of the European Commission legislative proposals on sustainable food systems due in 2023 will set the frame for a new generation of EU policies in the 2020s. Potentially these could be targeted at a wide range of actors, including citizens as a whole, specific consumer groups, schools, the health system, and of course the food processing, manufacturing, trading, service and retail industries. There are important questions about the cost and affordability of more sustainable diets, how to protect and enhance the welfare of lower income families and how to change the environment in which most consumers make their choices so that sustainable foods are as appealing

[35] Bellmann, C., (2019). *Subsidies and Sustainable Agriculture: Mapping the Policy Landscape.* Chatham House. https://www.chathamhouse.org/sites/default/files/Subsidies%20and%20Sustainable%20Ag%20-%20Mapping%20the%20Policy%20Landscape%20FINAL-compressed.pdf

and affordable as possible. These issues are a vital aspect of the just transition debate, not to be set on one side, even when the focus is primarily on agriculture (as in this paper).

Indeed, addressing the multiple links between consumption and production needs to be central to the effort to shift to sustainable food systems[36]. Although export markets will continue to be available to farmers in the EU, any significant domestic consumption changes will have profound impacts on them and others in the supply chain, not least those in the livestock sector. The changes in the balance between EU production and consumption could run either to increase EU net agri-food exports or reduce and even switch them to a net import position. It should be a policy priority to synchronise such changes so they work together as far as possible rather than creating avoidable conflicts, taking account of trade in the process.

As an example, EU producers should benefit if the transition results in a stronger preference for locally produced and seasonal food and if there is a growth in willingness to pay higher prices for sustainably produced and healthier food amongst groups for which this is affordable. Lower output does not necessarily mean reduced farm incomes. Changes in the pattern and level of demand will be an important influence. On one scenario, the combination of a dietary adjustment towards less animal products and perhaps less calorific intake by European consumers, accompanied by a reduction in food waste, could cause demand to shrink at a broadly corresponding rate to the prospective fall in EU farm output that is likely to arise from reductions in intensive production and livestock numbers and some removal of land from agriculture. A relatively balanced outcome of this kind in which all food chain actors, including domestic households, participate and the overall environmental footprint of the food system diminished, could be seen as a central plank of a just transition.

On the other hand, if EU food production falls significantly and consumption patterns are unchanged and this results in a corresponding increase in imports (and unchanged exports), the farming community may well feel that the burden has fallen disproportionately on them. This will be even more the case if the imports are not produced as sustainably as their equivalents in the EU, with "leakage" of environmental benefits occurring as well as lost market share and reduced competitiveness within the EU. Such a scenario underlines the importance of including trade and trade policy in the plans for transition and therefore addressing consumption and production issues in an integrated way.

[36] Baldock, D and K. Hart (2021), op cit.

Scenarios for different versions of transition are beginning to appear and these help to highlight the range of outcomes that might arise and varying approaches to justice as well as the uncertainties over the speed at which change will occur and how the different elements will impact on one another. A notable example is the recent publication by IDDRI "Towards a Just Transition for Food Systems", presenting scenarios for France. This includes a radical scenario, 'Socio-territorial recomposition', outlined briefly in Box 2, which raises both environmental standards and employment.

Box 2: The IDDRI 'Socio-territorial recomposition' scenario for France

The headline results of the analysis are that the significant changes proposed for the farming and the food processing system are feasible and can simultaneously:

- raise agricultural employment by 10%,
- increase agrifood employment by 7%,
- maintain agricultural incomes and at the same time
- restore biodiversity,
- hit French climate targets for GHG reductions (50% by 2050) and
- improve the diet and health of the population.

The methodology used is a novel approach, building on some key assumptions and blending statistical analysis of farming and the food processing sectors with 'narratives to elucidate trade-offs'[14,37]. It will take time for food sector modellers and other analysts to assess and evaluate this approach. The specific numerical results of this example of just transition, and its feasibility particularly with respect to the implied higher food prices and the interactions between France and the rest of the EU, and in turn with international trade beyond the EU, will no doubt be the source of much debate. The authors are trying, in their words, to avoid a "futile battle of entrenched beliefs"—a laudable objective.

[37] The analysis is based on the Model for Food Transition (MoFOT) used to analyse just the cereals and dairy sectors of French agriculture plus the related food industry. Its features are summarised on pages 11-12. The authors are well aware of the preliminary nature of the analysis and its results and how this type of analysis could and should be enlarged for all agricultural sectors and all the EU.

This study shows that there is much to play for in resolving the type of future that can be achieved in practice as well as the goals being pursued in agriculture. There is a need for both indicative scenarios and for analyses which can integrate market interactions with impacts on climate and biodiversity and consumer diets and health, whilst also considering the restructuring of farm systems and their economics long with the potential restructuring of the entire food chain.

7. THE IMPLICATIONS OF JUST TRANSITION IN AGRICULTURE

If a Green Deal transition took the shape sketched here, there would be socio-economic impacts for both consumers and those on the supply side. Clearly these will stretch beyond the farming community, with implications for the whole food chain—a substantial source of employment in most Member States. Within agriculture some changes would be felt relatively rapidly, others more gradually, for example when elderly farmers retire and their successors adopt new approaches. Some will manifest as variations on long-established trends in EU agriculture, such as the concentration of production on a smaller number of larger more competitive farms, a shrinking workforce, an increased incentive for co-operation between smaller holdings, increased average farm size and accentuated need to build skills and undertake training[38]. On a proportion of farms significant new investment will be required to enable changes in production systems and techniques, to acquire more appropriate equipment and buildings, to improve nutrient and waste management and storage and for other purposes. In some cases new systems may employ more people, for example where cage-based systems for poultry and pigs are being phased out. Affordability and access to credit will be issues, so too may be the terms of tenancy agreements to enable tenants to participate fully in the transition.

Some of the largest impacts on farm incomes can be expected to arise from changes in prices as well as the levels and mix of outputs. These are difficult to forecast given the many influences at work, including the degree of competition from imports, but prices could increase for certain products as predicted by some modelling exercises referred to below. Clearly, farm incomes also will be affected by changes in payments made under CAP and other agricultural policy schemes and diverse new sources of income for example from emerging ecosystem service, carbon and bioeconomy markets. Agricultural land prices, already highly variable across Europe, will reflect these new dynamics and if there are substantial changes this will affect farmers' management decisions and in some cases their capacity to borrow, as well as the asset value of those who own land.

There will clearly be variations in impacts between regions, between different production sectors and farming systems, between farms of different sizes, those

[38] There are many ways in which these structural changes in the management structures of farming can come about. For example, farm enlargement can occur as an existing farmer buys up some or all of the land of a neighbouring farm vacated by death or retirement. Equally rights to farm additional land can be acquired by renting or increasingly by less formal and often annual contract farming arrangements. The resulting structures with different interests of landowners and land managers will have their own preferences about how to make the transition in the face of the changing market conditions, policy incentives and regulations.

on highly productive or more marginal land, between the most efficient and the less successful, between owner occupiers and tenants. There will be specific regional aspects, for example: parts of Southern Europe where water is a challenge, the new Member States, and islands. These may raise specific transition issues and require special consideration. These are as important to understand as the broader brush development when trying to frame policy measures for a just transition. It will require probing analysis on a solid evidence base.

Although farming representatives generally highlight the potential costs of the transition for farm businesses there will be a complex and shifting mix of socio-economic benefits, as well as downsides, for producers. Aside from maintaining and extending market opportunities, greater climate stability, healthier soils and more robust long-term pest management are important for the economic as well as environmental health of farms and food production. The socio-economic and long-term benefits of greener production must be factored in with the expected costs in the coming decade. If benefits perceived by farmers are slower to arrive than costs, then this can be a justification for transition support.

Multiple impacts over an extended period in a diverse sector are difficult to forecast in advance. The Commission will prepare impact assessments for individual legal proposals under the Farm to Fork Strategy but not for the overall strategy itself. However, a number of studies have ventured into this field and can help to illuminate likely developments. As well as the IDDRI work referred to already there is the analysis of the implications of the Green Deal for agriculture, the environment and the CAP by Guyomard and Bureau et al. for the European Parliament (referenced above) and other studies published since the Green Deal targets emerged.

These studies, based on modelling exercises, present analyses of the potential impacts of the four principal quantitative variables targeted in the Farm to Fork and Biodiversity strategies (namely the reduction in nutrient surplus, and in the use and risk of pesticides, an increase in land under organic farming and the increased areas for high diversity landscape features). They include studies by the JRC and Kiel University using the CAPRI model[39], one for the USDA using the GTAP-AEZ and IFSA models[40] and one by Wageningen University using the

[39] Barreiro Hurle, J., Bogonos, M., Himics, M., Hristov, J., Perez Dominguez, I., Sahoo, A., Salputra, G., Weiss, F., Baldoni, E. and Elleby, C (2021), *Modelling environmental and climate ambition in the agricultural sector with the CAPRI model*. https://publications.jrc.ec.europa.eu/repository/handle/JRC121368

[40] Beckman, J., Maros Ivanic, J., Jelliffe, L., Baquedano, F., and Scott, S., (2020*). Economic and Food Security Impacts of Agricultural Input Reduction Under the European Union Green Deal's Farm to Fork and Biodiversity Strategies*. https://www.ers.usda.gov/publications/pub-details/?pubid=99740

AGMEMOD model and case studies[41]. The models generally indicate a projected decline in EU production of some major commodities and consequential price rise, but they are not designed to explore the offsetting environmental benefits in detail. The reports from the USDA and the European Commission Joint Research Centre (JRC), perhaps unsurprisingly, point in rather different directions. It is clear that market- and wider system- adjustments to such policy developments involve many factors of variable predictability: farm income outcomes may evolve in diverse and different ways.

It is worth noting that all of the recent studies based on models seek to capture only part of the broad Green Deal initiative (with an emphasis on the quantitative targets) and so have significant limitations. The Commission has published a factsheet dedicated to showing what the group of modelling exercises do and don't cover. Whilst acknowledging that the studies are useful, the factsheet includes the comment that the models used in all of them are "not capable of accounting for demand-side changes or the support provided by new legislative initiatives and the new Common Agricultural Policy" and therefore must be treated with caution[42].

Agricultural organisations also have contributed their own analysis. COCERAL[43], (the EU association of cereal and other crop producers) has assessed the impact of the Green Deal measures, presenting a wide range of scenarios, in all of which there is a fall in EU cereal production (and larger fall in Oil Seed Rape production). In agreement with the other studies they too expect cereal prices to rise as a consequence. The scale of this will depend partly on the assumed responsiveness of third country exporters. Of course, to the extent that EU price rise is avoided by additional imports then the issue of environmental leakage becomes real.

These possible economic impacts are further complicated by the consideration of risk and uncertainty. One of the main attractions to farmers of the use of mineral fertilisers and plant protection products is to reduce the variability of yields and income. But at the same time the cumulative use of such inputs over a long period may have systematically reduced the natural resilience in crop production. The complexity of the underlying biological and economic relationships and the need to make many assumptions in these analyses helps to explain the range of results

[41] Bremmer, J., Gonzalez-Martinez, A., Jongeneel, R., Huiting, H., Stokkers, R., (2020) *Effects of Farm to Fork and Biodiversity Strategy 2030 at farm, national and EU level*, Wageningen University Research. https://www.wur.nl/en/show/Impact-Assessment-Study-on-EC-2030.htm

[42] European Commission (2021) *Green Deal targets for 2030 and agricultural production studies.* https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/factsheet-farmtofork-comparison-table_en.pdf

[43] COCERAL (2021), *Farm to Fork Impact Assessment* http://www.coceral.com/data/1634212173COCERAL%20F2F%20impact%20assessment%20-%20Prez%20Live%20debate%2023.6.21.pdf

which emerge. All the studies cited stress that there are a great many other policies and factors not accounted for which further complicate drawing strong conclusions at this stage.

Nonetheless for planning future policy, a full analysis of the route to just transition and its consequences is required, spelling out the extent of change needed over an agreed period, initially to 2030 and then extending the analysis towards 2050.

Such an analytical frame would allow identification and perhaps even quantification of potential winners and losers. Certain current perceptions might not be well founded. There would be significant uncertainties, for example the extent to which retail food prices rise to accommodate additional costs where these arise. Many very small producers may not change their production methods significantly or be greatly affected. There may be factors that mitigate negative impacts, for example increased land prices for forestry and nature restoration, and new revenue sources for carbon sequestration and nature restoration.

For the purposes of discussion–in the absence of comprehensive analysis and with full recognition of the highly preliminary nature of this qualitative assessment—the broad pattern of those potentially advantaged or disadvantaged by the projected changes, particularly in economic terms, is sketched out below. These suggestions of some potential winners and losers are not forecasts. Rather they attempt to illustrate the type of impacts that could be expected and provide a starting point for considering what further interventions or collective actions might be necessary to ensure just transition.

Potential winners from transition might include:

- Producers able to exploit new added value markets, such as for fruit and vegetables and for higher welfare livestock products;
- Producers of crops relying on pollination;
- Leaders in lower impact food production such as organic suppliers;
- Producers establishing a competitive position in the use of new technologies or systems such as biocontrol or cage-free livestock systems;
- Providers of new inputs, knowledge and training;
- Those producers in well-organised collective structures able to share knowledge, costs of new equipment, the costs of new market development efforts;

- Land management businesses where recreation, amenity and hospitality-based activity is enhanced by the transformed rural environment;

- Producers in Member States or regions where there is strongly targeted support for the transition through national and CAP based measures and the establishment of new ecosystem markets such as for carbon. Easy access to credit could be a factor too;

- Those able to benefit from increased land prices where these occur. Prices could rise on land with currently limited production potential but where the scope for offering environmental services such as carbon sequestration may be relatively high. This would be in areas where incentives are available either via public sector agro-environmental measures or private schemes or both.

There is some overlap between these categories and unavoidable uncertainty about the scale and duration of income effects, as is equally true of potential losers.

Key potential losers from transition might include:

- Those livestock producers and farm workers who cease to be able to make a living from this form of production. Several factors may be involved, such as an inability to adjust to new market and societal demands, a potential overall shrinkage in the market for livestock products, particularly affecting the least competitive producers, and in some cases an inability to switch from caged to uncaged systems or alternative forms of production.

- Whilst a high proportion of European family farm businesses have no employees, there are sectors, for example in livestock husbandry, especially dairying, with significant employment of skilled farm workers. Those on economically vulnerable, less sustainable farms face risks to employment as the transition proceeds. Fair treatment of workers is clearly a key element of a just transition and applies not only to farm workers but also to the very much larger workforce in the downstream livestock slaughtering and product processing sectors.

- Those farms where the barriers to change are particularly high, for example because of the age of the farmer, the small scale of the holding, unfavourable tenure conditions, lack of access to capital and/or credit, remoteness from new markets, or difficulties in entering co-operatives, which may be the most viable survival route for many small farmers.

- Those engaged in farming land on which agricultural production should cease in favour of climate and nature protection in the form of forestry, peat and

habitat restoration. This will include farms on peatland soils that are re-wetted and removed entirely from production or confined to changed practices including paludiculture. Several Member States, including Germany, are now investing in larger programmes of peatland protection and restoration, a portion of which may displace conventional agricultural production. However, such schemes tend to be voluntary and supported by considerable compensation payments to landowners. There is little sign yet of mandatory withdrawal of peatland soils from agricultural production in the EU without compensation.

- Some producers with a particularly high reliance on agrochemical inputs which will be subject to measures to discourage current levels of use. The extent of potential losses is difficult to gauge as there are alternative products and methods of production available, many producers have strong technical support and access to information and price adjustments are possible if costs rise across the whole of the productive sector in the EU. Losses, if any, might be concentrated in particular locations or product lines or in certain years when pests or diseases are especially destructive. There will also be opportunities for retailers and other purchasers to provide aid, especially as they often have tougher requirements related to agrochemical use than those enforced by governments. As in other sectors, there is the possibility that imports from outside the EU, where produced to lower standards, could gain market share and create losers within Europe.

- Providers of agrochemical and other farm inputs, although for plant protection products there will be some market expansion for alternative methods of pest control such as biocontrol.

- Less educated and some elderly farmers in sectors where a growth in knowledge and perhaps participation in environmentally focused training programmes is essential to be able to comply with legislation or meet more demanding market conditions. Examples might include the need to utilise precision farming techniques to meet certain environmental standards required by law or the need to measure performance for example using a carbon calculator to retain access to a given market.

- Farmers, farm workers and supply chains in regions where less sustainable systems are more concentrated and new investment is more difficult to justify as conditions change. This may be for a mixture of reasons. Areas with acute water shortages would be one example. Another example might be farmers in poorer regions and those with tenure conditions where private markets for ecosystem services such as carbon sequestration or clean water develop more

slowly than the average, resulting in farmers having fewer income options than those in more advanced regions.

- Farmers and farm workers in regions with relatively limited government support for transition, and a corresponding paucity of attractive incentive schemes, limited private markets and poor information provision regarding what is required to meet new environmental conditions.

Perhaps most controversial and least clear is the extent to which losses may occur in the mainstream arable sector, the farms producing cereals, oilseeds, pulses, roots and other crops on a large scale. Some producers fear that since the Farm to Fork and Biodiversity strategies will require reductions in both input and production intensity, lowering yields, this may reduce already marginal profitability per hectare, unless there is a corresponding price increase. This could increase reliance on CAP basic payment subsidies which may decline in future. If there is enhanced competition from imports this could increase pressure on EU farm incomes.

This preliminary analysis suggests that there could be significant losers from this (as from earlier) transitions in the absence of mitigating action, including increased support from either private or public sources. However, it will be easier to identify certain categories of loser in advance than others. There are likely to be winners too, especially if the prices of at least some more sustainably produced foods rises, but this group too may be relatively diverse and not easy to forecast precisely in advance.

In summary, there seem likely to be at least two major groups of farmers, farm workers and agricultural landowners particularly affected by the environmental dimension of the transition. These are:

- Those who will be most affected by the farming system changes required– related to the use of agrochemicals and fertilisers, conversion to organic and the expansion of protected areas on farms. Those most concerned about this are those with the greatest dependency on the use of these inputs—especially arable farmers and fruit and vegetable producers.

- Those who will be most affected by the redeployment of land now under agricultural management for carbon sequestration in forest and peat and for the enlargement or enrichment of nature areas. Many of these are extensive livestock producers at present.

In addition, there are two different groups of livestock farmers which potentially will be affected by a broader transition beyond the requirements of the Green Deal agenda. These are:

- Those intensive producers of poultry, pigs and rabbits who utilise caged systems and will be required to cease doing so.
- A less defined group of livestock producers who could be affected by a decline in consumption of meat or dairy products resulting from changing consumer choices and both health and environmental policy interventions in the coming years.

It would be extremely surprising if there were no adverse impacts to transition. The rationale behind the transition is not to drive up farm incomes but to increase the sustainability of farming and land use in Europe and meet environmental conditions required for the health of the planet. At the same time, net value added could increase in the agricultural sector as the market adjusts if there is significant willingness and ability to pay more for sustainable food, but this is far from guaranteed. In this sense, acknowledging that the farm sector and those employed in it are exposed to risks and that there will be losers might help to build confidence among the farming community and facilitate constructive engagement. Beyond this, a just transition would entail building the capacity and resources to help potential losers who find themselves bearing more than a fair share of transition costs.

The special cases of livestock production and the utilisation of peat soils clearly need particular investigation. In these and other cases it is likely that incentives for change will be put in place and owners of peat soils may find that net returns increase if these incentives are sufficiently large. In some cases, change may be accompanied by compensatory measures of the kind that have occurred in the EU in the past for example when the sugar sector was reformed and a number of processing plants in less competitive regions were closed.

Unsurprisingly, many of the factors to consider in assessing impacts and the extent of potential losers are familiar from past experience and the long-term adjustments that have taken place in the agriculture sector across Europe. These include the extent of natural and human capital resources on farms, issues of scale, age and education, the strength of local institutions and supply chains, geographical location and access to support from government sources. In addition, the countries of central and eastern Europe have experienced significant transformation since the collapse of the Soviet Union in 1989, involving large scale changes in agriculture, including the collapse of many large collective farms and a loss of jobs. Those which joined the EU have had access to pre-accession

assistance and post-accession access to the EU market and the CAP. There will be lessons learned from this experience and the policies introduced to mitigate the worst impacts.

Looking ahead, it may be possible to identify regions where the challenges are particularly great because of a concentration of factors of the kind outlined here. Some of these regions appear likely to coincide with those rural areas already subject to a range of disadvantages, for example in central and southern Europe[44].

Market dynamics are much less predictable. Most of the evidence on the impacts of input restrictions or switches to organic/agroecological farming are based on comparative static analyses of the differences between farms pursuing each set of practices. There is very little evidence based on observed responses to inducements to change farming systems. Indeed, the debate at present provides little clarity on what the mix of incentives to bring about transition will be. This is likely to include a range of instruments from pollution taxes, quantitative restrictions in usage of certain products, non-approval of certain active substances in Plant Protection Products, public payments to adopt practices or farming systems, and private payments for certain environmental outcomes (such as biodiversity gain and carbon sequestration). The mix of these instruments chosen will produce different responses and different just transition considerations.

It is also important to emphasise that the nature of the participation of the other actors in the food chain could make a big difference to the success of transition taking place and the impacts on farmers. Strong and supportive action by private actors in the market–including processors, retailers and input suppliers–is needed and could be a powerful driver of change. Offering a fair deal to farmers and farm workers in the course of change is important in itself and also would moderate the need for publicly financed and managed transition support measures. Companies in the food chain have the possibility to influence consumer attitudes, behaviour and eating habits in the way they formulate, distribute, price and promote their products. It is clear that some, including some major players, are indeed thinking in this direction and are willing to help their farmer customers or suppliers with the information, knowledge, and perhaps some of the investment and cost sharing to bring this about. It would be helpful to map out the scope for such actions in more concrete terms. This could make a significant difference to

[44] For some of the challenges and ways forward for these areas see the recent EU long term vision for rural areas. (EAT-Lancet (n,d) *Food Planet Health* : *Food Planet Health*. https://ec.europa.eu/info/strategy/priorities-2019-2024/new-push-european-democracy/long-term-vision-rural-areas_en)

the speed and effectiveness of transition and the design and scale of public measures to ensure the transition is just.

8. POLICY PROPOSALS: TOWARDS A MORE JUST TRANSITION FOR AGRICULTURE

The steps towards a just transition in the agriculture sector should be tailored to the special character of agriculture and associated land use. They must be fully integrated into the dense fabric of policy interventions that already apply to farming and food through the CAP and other policies at EU and Member State level. They also should fit within a coherent approach to change within the wider food chain: agriculture is not an isolated activity.

There is a clear rationale for a just transition through the need to share the effort and costs of meeting goals established for the collective interest. The case for compensation is stronger in principle if hardship arises from changes driven by deliberate policy choices rather than from independent changes in technologies and market preferences which are more routine hazards of running an enterprise. At the same time, the political reality of persuading reluctant actors to engage, overcoming inertia and preventing political blockages has to be taken into account. A transition plan should consider the most appropriate forms of inducement to bring about change, including compensation for losers where this is justified.

There can be many forms of transition assistance offered. For example, it can take the form of public and private payments, which can be annual, capital payments or loans. The help can equally be provided through education, advice, information, and setting up collaboration mechanisms horizontally or vertically in the food chain. Some measures are likely to be needed to create obligations on food chain actors outside farming to share the adjustment costs. A package of interventions should reflect a fair balance of cost and burden sharing within Europe, taking account of large variations in regional wealth and capacity. Cohesion and level playing field considerations point to a significant role for measures at the EU level and for action paid for through central mechanisms, which might include levies or cost recovery systems.

This undoubtedly creates a considerable challenge with a wide range of factors to consider and much variation between farms, production sectors, land uses and regions. However, there are already in place extensive funding mechanisms to help the sector, notably the CAP.

A full analysis of the route to just transition and its consequences is required, spelling out the extent of change needed over an agreed period, initially to 2030 and then extending the analysis towards 2050. Such an analytical frame would

allow identification and perhaps even quantification of potential winners and losers.

Table 2 offers a simplified and non-exhaustive summary of the elements of the transition to be considered, the broad benefits expected (i.e. why transition is being undertaken) and lists some of the groups that could face negative impacts, with certain possible winners highlighted very briefly as well. It also signposts some potential inducements to bring about transition, with the main emphasis on policy measures. These are different from the possible forms of just transition compensation or adjustment assistance which could be offered to those whose interests are harmed, shown in the last column.

Table 2: Transition and just transition actions for agriculture and land use – and the wider food chain

Sector	Transition aspects	Benefits sought	Groups potentially negatively impacted	Possible transition inducements	Possible Just Transition compensation tools
Agriculture and land use					
Agriculture and horticulture	Reduce GHG emissions and pollution Reduce use of mineral fertilisers, synthetic pesticides and antibiotics Manage more land for biodiversity and carbon removal Charge to agroecology Increase the area of organic Adopt new technologies including vertical production Improve animal welfare and eliminate cages Measurement, reporting and audit requirements change More demanding certification schemes	Reduced pollution and GHG emissions Higher soil C, better soil functioning Better water management Halt and reverse biodiversity decline Strengthen economic viability, including longer term Protect medical value of antibiotics Improve animal welfare	Farmer and farm worker displacement – Those who cannot or will not adjust – Some extensive grazing / upland, e.g. displaced by trees – Intensive livestock producers – Some specialist sectors, e.g. pesticide reliant fruit producers – Some small and less flexible farmers? Specific issues for tenants Seasonal and casual workers	Input restrictions/taxes Pollution taxes? More demanding food industry/market requirements Education, advisory services, pilots Investment advice, grants and loans Public money for public goods, more targeted CAP schemes System conversion payments Agri-environment & climate supports Food industry sustainable sourcing Training Certification and labelling Requirements of credit/banking companies	Transitional Adjustment Assistance to farmers within the CAP, replacing basic payments, to supplement payments for the provision of public goods, including new environmental management practices Help for rural economic diversification Farmer buy-out / retirement schemes Structural funds to assist broader regional development

Sector	Transition aspects	Benefits sought	Groups potentially negatively impacted	Possible transition inducements	Possible Just Transition compensation tools
Forestry and peat managers	Increase woodland regeneration and afforestation Peat rewetting / restoration Extensification or removal of conventional farming on some peatland, growth of paludiculture	Carbon sequestration Water management Biodiversity enhancement	Producers on peat soils, peat extraction industry	Land use change and ecosystem restoration incentives' including tailored agri-environment schemes for compatible forms of very low intensity farming Carbon and other environmental markets: Some regulation – e.g. on peat management and use	Probably restricted to strong regulatory scenarios where change in land use or key forms of management are mandatory.
Upstream and downstream sectors in outline					
Input suppliers	Reduce GHG emissions and use of mineral fertilisers, synthetic pesticides & antibiotics Develop new green products and management strategies	Reduced biodiversity damage and GHG emissions and more nature recovery Reduced water and soil pollution Less use of antibiotics outside medical applications	Workers in some current supply industries and the companies themselves Farm animal vets, antibiotic suppliers But gains from new products and services New markets on organic farms, for Nitrate inhibitors etc	More stringent licencing and regulation Taxes and restrictions on use R&D and Innovation funding	Mostly a private sector adjustment

Sector	Transition aspects	Benefits sought	Groups potentially negatively impacted	Possible transition inducements	Possible Just Transition compensation tools
Food processors	Reduce GHG emissions Waste reduction Less livestock throughput Healthier food formulation More circular bioeconomy Sustainability assessment, labelling, certification, verification etc Fairer deal for farmers	Improved health Lower health costs Reduced pollution & GHG emissions Less biodiversity damage and more recovery Greater resource efficiency and circularity in production	Slaughterhouse and other livestock chain employees Meat and milk processors and distributors Producers of less sustainable and less healthy food but also gains for those who switch to new products, some higher value.	Regulation on food formulations (sugar, salt content) and portion size Sustainability standards, reporting requirements, audits etc Pledges and targets to reduce emissions Future targets on proportion of sales that comprise sustainably produced foods Media/social media pressure in a very visible industry R&D, Innovation aid	Some targeted retraining and adjustment support Regional / local aid in most affected localities
Food retail and service	Reduce GHG emissions Waste reduction Less livestock products Healthier food formulation and product offer Changes in food environment and promotion to consumers Sustainability assessment etc Consumer education Fairer deal for farmers Reduced packaging, greater circularity	Improved health Lower health costs Reduced pollution Less biodiversity damage and more recovery More educated consumers	Vendors of less sustainable and less healthy food but also gains for those who switch to new products, some higher value. Some specific trades and businesses e.g. certain butchers, steak house staff?	Regulation of food advertising & placement Sustainability audits Regulation on food formulations (sugar, salt content) and portion size Sustainability standards, reporting requirements, audits etc Pledges and targets to reduce emissions Possible future targets on the share of sales accounted for by sustainably produced foods Media / social media pressure in a very visible industry	Some targeted retraining and adjustment support Regional / local aid in most affected localities

Sector	Transition aspects	Benefits sought	Groups potentially negatively impacted	Possible transition inducements	Possible Just Transition compensation tools
Food consumers	Switch to more sustainable diet in terms of health (less sugar, fat, animal and ultra-processed food). More vegetables and fruit And lower environmental footprint Lower GHG emissions Less waste	Improved health, Lower health costs Reduced GHG, water & air pollution Reduced biodiversity degradation	Poor consumers if prices rise Other more vulnerable groups such as children, large households, elderly, those in gig economy and on benefits	Education, training, information, campaigns Public institutions' menus Food chain regulation Carbon, fat or sugar taxes Support targeted at vulnerable groups Labelling and marketing Improving consumer choice architecture	Depends on circumstances, e.g. welfare improvements and appropriate payments to counter food poverty and any price increases

A balanced transition plan should be developed for the EU with full input from stakeholders to spell out the steps required, the responsibilities to be shouldered and the role of different actors in doing so. Specific EU led and EU funded measures will be part of this, alongside measures at Member State level and private sector responsibilities and initiatives. This will need a timetable and clear sightlines on the meeting of targets, acknowledging the role that the sector will play, the importance of the farming community in building a sustainable future and the ways in which this will be a just transition.

Ten key components of a balanced approach are suggested:

1. **Enhanced engagement with the farming and land managing communities, including agricultural workers.** This is a priority for achieving just transition in any sector, as emphasised in the literature. It is especially true in agriculture, with such diversity and so many relatively small enterprises and socially sensitive issues involved. It requires proactive effort at the more local and regional level as well as within EU circles. Given the dimensions of the changes foreseen it is helpful to consider ways of involving different combinations of actors as well as the classical segments of the supply chain. To match the breadth of the transition, farmers should be brought together with other stakeholders for example in the food chain and in the environmental sphere; fresh ways of involving different combinations of actors would add real value. Engagement is not only to help farmers, farmworkers and others to think through and prepare for the different strands of the transition but also to give a greater role for the farming community in contributing to shaping the many elements not yet in place. In some Member States the channels for engagement and the resources available to support it will be more developed and generous than others. This creates the risk of an uneven pattern of engagement, information and preparation for transition. Given this potential failure of cohesion there is a strong argument for launching an EU-wide initiative with a strong element of EU funding, particularly to assist less prosperous Member States in Central and Southern Europe.

2. **Preparatory, analytical and supportive work.** This includes a spectrum of initiatives that can be organised on a European scale, including research and development (R&D), studies and modelling exercises on key topics, impact assessments addressing both environmental and socio-economic outcomes, the development of new policies, indicators and metrics (for example on soil management and habitat restoration), pilot projects, development of new markets. This would clarify the transition to come, add substance and capacity to judge the consequences for different

parties and aid both planning and engagement. One important element would be intensified R&D investment on a European scale. This is needed not only to help to establish the production methods, technologies and management systems required to meet transition goals throughout Europe but also to examine the socio-economic consequences and increase the role of social science in the analysis of issues and formulation of responses. Level playing field considerations apply strongly here as well.

3. **Building knowledge, skills and capacity.** Existing policies to build skills and expertise in the farming community and agricultural workforce could be extended and focused more on the transition ahead. Many of the new forms of land management that will be needed to meet both environmental goals and market requirements will involve greater depth of knowledge and expertise in new technologies than many farmers and workers, especially those in older age groups, possess. Carbon accounting can be a challenge for example. Funding for an enhanced training effort could come from a variety of sources, including food chain partners, producer groups, national funds and a larger dedicated component of the CAP. Whilst university and vocational college education and training for farmers and other land managers is mostly a Member State competence, there is great value in exchange schemes to ensure that best course design and practice can be shared between Member States.

4. **Fair terms and fair prices for farmers in the food chain.** It is already a policy goal in the EU to seek fair prices for farmers and to avoid unfair treatment of farmers by other food chain actors, mainly downstream of the farmgate. However, greater mobilisation of private sector support, both through the food chain and related sectors, such as finance, is required. This could be encouraged by EU measures to establish more concrete obligations for retailers and others, building on current legislation. Contractual terms that leave producers exposed to excessive levels of risk, for example large buyers being free to drastically change orders at the last moment, can undermine the viability of farms more than is usual during a period of transition. If retailers and food service companies raise price levels in response to sustainability requirements it is especially important that farmers receive a fair share of the increased revenues. Continued attention is required to the development of codes of conduct in the food chain and means of enforcing them. For many farmers transition would be eased by arrangements with key buyers of their products whereby they agree to meet higher standards and in return receive guaranteed prices for a period of years to allow the necessary investment and adjustment. Similarly, if EU producers following higher environmental and animal

welfare standards are significantly undercut by imports from countries with lower standards, measures to redress this will be required. Given the difficulties of applying Carbon Border Adjustment Taxes in the agriculture sector, alternative approaches will be needed.

5. **Developing new income streams and markets for sustainable activities.** As noted already the transition is likely to produce increased demand for primarily environmental forms of land management, including habitat restoration, soil carbon management, peatland restoration, new areas of woody vegetation and forest, and perhaps sustainably grown bioenergy crops if suitably scaled carbon capture and storage can be developed. Some of these will be rewarded through incentive measures under the CAP, such as the current and future agri-environment and climate schemes. However, there is also an emerging market for some ecosystem services in parts of Europe, including payments for reduced nutrient use in water catchment areas, payments for carbon capture in woodlands and peatlands and various offset schemes. Many of these new "markets" are at an early stage of development and in some cases will advance only with considerable investment in creating workable and trustworthy conditions[45] such as the establishment of appropriate rules, structures, ways of measuring and rewarding "outputs". Bringing forward this investment and accelerating the development of these markets would widen the flow of new sources of income into the sector, reduce some areas of uncertainty and compensate for potential losses of income, amongst livestock producers for example. This can be achieved by the development of measures at both the national- and EU level.

6. **Better use of CAP basic payments to support greater environmental sustainability.** Member States are in the process of drawing up CAP strategic plans to set out which measures they intend to apply from 2023 onwards. This is the moment at which the transition can be aided by the selection of measures that can play a direct role in helping farmers to adjust to the Green Deal priorities over the period to 2030. Many of these measures (now known as "interventions") are in Pillar II of the CAP but the new eco-schemes in Pillar I also have considerable potential for this purpose. Rural development measures that could be employed with greater ambition include not only agri-environment and investment aid measures but also training schemes, non-productive investments, help for

[45] Some caution is advised in this arena. Farmers are enthusiastic in principle about these potential new income streams, and care will be required to ensure the robustness of such schemes to deliver verifiable additionality and permanence without double funding. And this applies whether they are publicly or privately funded.

farmers establishing shorter supply chains, aid for increased co-operation between farms, assistance for rural areas facing particular adjustment challenges and potentially forms of early retirement aid that create opportunities for new entrants and approaches to management. An environmentally targeted form of early retirement aid could focus on areas where a change of production and/or land use is required for sustainability reasons but existing land managers are reluctant to change, for example moving out of livestock production. As the more detailed EU legal requirements to implement the Farm to Fork, Biodiversity and other strategies are agreed and the intervention instruments to bring them about are put in place in the next two to three years the need for supportive CAP funded measures will become even greater.

7. **Targeted supplementary transition aid.** In addition to the more strategic and focused use of CAP measures there is also likely to be a need for specific forms of time-limited assistance for groups of farmers or regions facing particularly severe challenges as these emerge. It is too early to predict where these are most likely to arise; indeed, on more optimistic scenarios there may be patterns of adjustment that maintain the viability of the great majority of farms (see e.g. IDRRI 2021). However, there is a case for developing a toolbox of measures that could be used by Member States with due regard to the level playing field within the EU but without unreasonable state aid limitations. The toolbox would include the use of a range of EU funds, including ERDF for example, and should not be confined to the ambit of the CAP. Some of these approaches to support may be compensatory, effectively providing a short-term payment for a one-off change, for example when producers had lost livelihoods directly as a result of a regulatory change and had no alternative income sources. Other approaches could be more facilitative, geared to supporting future forms of management. For example, there are many locations where a wider river catchment or landscape scale approach to land management rather than reliance on separate agreements with individual farms would greatly assist the meeting of biodiversity, water management or climate objectives. This either requires much enhanced cooperation and collaboration mechanisms between many existing private landowners and often funding for facilitators, or more radical models involving public or pooled, land ownership and tenure. Any extension of public rights over private land would necessitate appropriate buy-out or compensation which could be another form of transitional aid.

8. **Fairness between Member States, re-align the distribution of the CAP budget with the requirements of the transition.** The burdens and

benefits of transition will not fall evenly on all Member States and a strategic commitment to just transition should include an effective means of addressing significant imbalances. This has clear implications for the distribution of the post 2027 CAP budget which offers perhaps the most obvious mechanism for rebalancing. Agriculture is the only EU economic sector to have a fund like this and after 2027 there will be the opportunity to align it more with the provision of environmental public goods and support for transition in line with EU priorities, following the logic of the Green Deal. At present the debate over fair shares in the allocation of CAP funds between Member States is dominated by issues such as how close the payments per hectare are across and between countries. This reflects a preoccupation with historic claims rather than future European needs. A fresh approach based on future needs to help transition could be developed using more forward-looking budget allocation indicators to guide the distribution for each Member State. There is a substantive discussion to be had on how to measure the relative adjustment burdens, but this could at least start from some objective measures per Member State of the relative carbon intensity of production and some broad indicator of biodiversity depletion. Inevitably there will be political resistance in some quarters to any CAP budget re-distribution, but there is no doubt that inter-Member State fairness is an important aspect of just transition.

9. **Fairness for rural communities.** It is not only farmers, farm workers, landowners and other land managers who are affected by the changes involved in the transition. Energy costs, mobility and transport create particular concerns for rural communities. Rural areas are characterised by their spatial dispersion, low density and remoteness and often difficult-to-insulate housing stock. They consequently bear a burden of heavier fuel and transport costs than urban areas and cities. Helping rural communities to adjust is another dimension of just transition. Here there are also opportunities to utilise and develop EU funding mechanisms accordingly. The CAP rural development and EU social funds thus are amongst the instruments available to deploy to ensure that the rural areas, reaching more broadly than just agricultural households, are fairly treated by transition to a low carbon economy. Dedicated rural region transition grants might be a mechanism to focus more support on particularly vulnerable regions.

10. **Fairness amongst consumers**. Finally, even though this paper has focussed on agricultural transition, it has been pointed out that changes in food consumption and management of the food system to reduce waste

are critical elements of the transition for the combined food and agricultural sectors. A key consideration of the combined move to sustainable food production and consumption diets is the price and affordability of food, in turn linked to the food environments in which consumers make their choices. In principle, policy should move in ways that help to make sustainable foods less costly than those that have a more damaging footprint, for example by taxing environmentally destructive activities. Higher prices for a number of foods may arise and would be justified in order to internalise negative environmental and social externalities in the system, and to avoid unfair terms for farmers. Higher farmgate prices for some products might be needed to facilitate the maintenance of viable farm businesses in sectors where the transition means that farmers will need to reduce intensity and the overall area devoted to farming. Yet without countervailing action higher food prices are likely to be regressive, hurting most the poorest consumers in each Member State, and the poorest Member States. Credible redress for these potential effects is vital to secure the transition. This is likely to require national welfare adjustments as well as appropriate adjustments through the EU budget and Green recovery programmes.

The financing of Just Transition should come partly via further reform of the CAP but also other EU and Member State public funds. Some can be privately funded: from the food chain, including from consumers, and also potentially from private companies seeking environmental benefits.

9. CONCLUDING THOUGHTS

Although the concept of just transition has been applied primarily in the industrial and mining spheres it has relevance to the future of agriculture and related rural land use as well. In contrast to the expected ultimate complete closure of some power sources and industrial processes, the impacts of the social and policy driven changes that are due to affect agriculture are likely to be more diffuse and varied.

Given the scale of transition now needed in Europe it merits a larger place in the political dialogue about future policy and a specific plan of its own, additional to other transition programmes.

Planning for transition involves assessment of impacts and interactions and starting to identify future potential winners and losers. Given the uncertainties this is somewhat hazardous as well as helpful. There are serious challenges entailed in seeking to assess the full consequences of a complex transition that is driven by health and consumer concerns as well as the multiple strands of the sustainability agenda. It is not surprising that the initial analyses of the potential impacts of the Farm to Fork and Biodiversity proposals conducted in the wake of the proposals by academics and public bodies have significant limitations. No single modelling approach is yet capable of convincingly integrating the micro and macroeconomic effects with the climate, ecological and social impacts of the transition process. The sketch of possible winners and losers offered in this paper is a preliminary illustration of what might be expected from the measures proposed in the rubric of the Green Deal. More detailed analysis is needed.

Building a fuller picture of what can be expected will take time and requires further evidence of how policies are being fleshed out and implemented, together with developments in markets and technology. Member States' decisions on deploying their funds under the CAP in the period to 2027 and the mix of measures they will use within their strategic plans, will also have to be factored in.

However, it is not premature to start building a picture of potential outcomes and considering how to address consequences that might coalesce into an unjust transition. Interrogating the options further at this stage has value. This is not only because a just transition is inherently desirable but also because a clearer picture of what might be offered to balance losses in the transition might enhance the level of engagement with the agricultural sector and potentially increase the degree of acceptance of the underlying changes required. Current hostility to some of the Green Deal agenda in parts of the farming community might be

softened and be less of a barrier to change if credible and measured forms of support for potential losers figured more prominently in the debate. Hence there is a need to start preparing a European just transition plan for the sector now and building in a concern with social justice in a broad sense from the outset.

While it may be difficult to define the transition very rigorously and tightly at this stage, it is important to distinguish between the menu of measures that have been devised in the Green Deal to address the unprecedented and distinctive set of changes necessary in the food system, and the long running defensive arguments for maintaining the status quo in the CAP. There is a history of embedding an inflexible long-term compensatory culture in the first pillar of the CAP. Understandably this may arouse suspicion amongst many in the policy community that just transition may be used as a new argument to protect vested interests. Legitimate compensation to farmers which justifies the description 'just transition' must be tailored to specific groups of potential losers, including farm workers, not the whole gamut of traditional beneficiaries from the CAP. It must be based on evidence.

Clearer criteria are needed for what would qualify as assistance for just transition given the special character of the sector explored in this paper. For example, *ex post* criteria for judging if justice has been served by a transition could include:

- Did the transition take place, and was it expedited in a timely and effective way avoiding the costs and injustices of inaction?
- How far was the transition driven by policy interventions pursuing a public interest rather than adjustments caused principally by changes in technology or in market demand, where the case for compensation is weaker?
- Were those for whom the transition meant they had to change occupation or look for new and additional sources of income appropriately engaged and assisted?

Measures to support a just transition must have due regard for farm workers and farmers as primary producers and land managers, but also must take account of a broader spectrum of those potentially affected, including rural communities, workers in other parts of the food chain and consumers. The programme of interventions both within and outside the CAP should be part of a broader, balanced approach within the whole food system, aiming to allocate a fair distribution of responsibilities, with support available in response to demonstrated need.

At the same time, landowners and managers have their own responsibility to change their practices and businesses, not least to protect perhaps their most precious asset – their land and soil. If they are not doing this fast enough, or fully enough for the public good, a fair transition must involve a degree of push from the state, i.e. a firm administration of the polluters pays principle and well-enforced regulation. Multiple policy options should always be in the policy armoury assembled for a smart as well as a just transition. They must include both the means to assist and compensate where this is fair, reasonable and effective, and the capacity and willingness to regulate where this is necessary. The goal is a balanced and smart policy mix, developed with the active involvement of a wide range of stakeholders.

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