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The EU's Common Agriculture Policy and Sustainable Farming: A statement by scientists

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Summary

The European Union's (EU) Common Agricultural Policy (CAP) still fails to address the environmental and socioeconomic challenges of EU's agriculture. Agricultural ecosystems are further degrading, biodiversity is declining and agricultural Greenhouse Gas (GHG) emissions remain high. At the same time, farms are facing unresolved socio-economic challenges and rural areas struggle to remain viable. Knowledge, data, instruments and resources to address sustainability challenges are readily available. Missing is the CAP's appropriate design as well as prioritization, and the indispensable political will to improve these.

While the Commission's 2018 proposal fell short of addressing the key weaknesses of the CAP, the amendment proposals of October 2020 by the Council and the Parliament significantly weaken the CAP's environmental instruments, while maintaining or even enhancing the inequitable and counterproductive distribution of payments. A weakened CAP puts both the environment and the future of farmers and farming at risk.

Scientific evidence shows that it is possible and efficient to align sustainable farming, multifunctional agroforestry and long-term prosperity with the climate and biodiversity goals of the EU. Farmers' interests and environmental protection can be mutually reinforced and achieved through a CAP that is aligns with the EU's Green Deal and Biodiversity Strategy, while also conforming to the Paris Agreement.

The proposed CAP post-2020 as it stands represents a business-as-usual model of agriculture against the viable alternative of a responsible and sustainable farm model that ensures the viability of rural communities. The narrative in support of this foundering approach, by stressing the importance of food production and the need to feed the world, is counteracted by a reality of more farmland taken for the production of fuel and feed for animals than for human consumption. The political positions also fail to represent the interests and needs of most farmers, who want to protect their living environment so in order to secure the long-term sustainability of their own farming - but rightly ask for public policy support. The CAP should provide better means to do so, and aim at a fair transition toward a sustainable future for farming.

The trilogue negotiations are a last opportunity to rethink the CAP post-2020 design and propose legal texts that allow, rather than impede, environmental and social ambition in line with the EU's statement that the next CAP will be fairer and greener.

Using the time gained by the transition period of two years, we strongly recommend to Member States, the Council and the Parliament to rethink the current proposal. We specifically urge to:

1) Maintain conditionality along the lines set by the Commission, and improve it by

   a) expanding permanent pasture protection beyond protected areas (Natura 2000) and

   b) maintaining or restoring at least 10% non-productive, semi-natural landscape features on all utilized agricultural area rather than only on arable land;
2) Ring-fence budgets for Agri-Environment-Climate Measures and allow Member States to expand their budgets beyond current levels;
3) Secure at least 30% of Pillar 1's budget for Eco-schemes and use current knowledge to ensure Eco-schemes are well designed (i.e., include only effective measures for

biodiversity), monitored and re-evaluated to achieve measurable environmental impacts;

4) Place Areas of Nature Constraints in Pillar 1, or tie them strictly to environmental objectives and the protection of High Nature Value farmland regions, rather than unduly list them as an environmental instrument without substantive criteria;
5) Cancel a) ring-fencing for direct payments (especially coupled payments), b) the barrier on Member States' maximum investment in the environment, and c) the limitation for budget transfers to Pillar 2. These restrictions impede ambitious Member States from investing in rural areas and in public goods;
6) Place a clear target for reducing, toward phasing out, of coupled payments (e.g. toward 5%) as subsidies that are harmful for both markets and the environment;
7) If Direct Payments remain a political priority, and more equity among the recipients is the proposed means to address farmer's concerns, then the Council and Parliament should make the Capping and Redistribution mechanism mandatory for all Member States, and set strict capping rules;
8) Ensure the success of the new Delivery Model by means of a) linking Strategic Plans to the EU's Green Deal, b) retaining the yearly reporting of Result indicators, and c) improving the integration of scientists and other experts in the consultation processes offered by Agricultural Knowledge and Innovation Systems (AKIS).

Science across all disciplines is available to address the agricultural sustainability challenge and improve the CAP. **Over 3600 signatories have supported the call to improve the CAP. They underlined the feasibility of constructive changes and documented the readiness to assist in positively transforming and future-proofing the CAP and the EU's agriculture** (Pe'er et al. 2020).

Keywords

Common Agricultural Policy, Sustainability, farming, biodiversity, climate, soil, ecosystem services, subsidies, policy reform, EU Green Deal

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I Trilogue negotiations are the last resort to set back the CAP on track

The CAP performs poorly against many sustainability criteria, both environmental ones (Supplementary Information #1 below) and socio-economic ones (Supplementary Information #2). Attempts to improve these aspects in the 2014-2020 period, following the 2013 reform, have not delivered due to a policy design that weak already in its initial design (Supplementary Information #3). The mistakes of the previous reform must be avoided, and science shows that this is highly feasible despite the weaknesses of the Commission's 2018 proposal (Pe'er et al. 2020; Supplementary Information #4).

Considering the broad public demand for environmental improvement, the CAP should improve to both protect the environment and support farmers in a sustainable and targeted way. Accordingly the Trilogue negotiations must take into account:

- **the targets of reducing agricultural GHG emissions, halting biodiversity decline, loss of natural resources as well as slowing or reversing the rural exodus, all of which are embedded in the CAP's own objectives.**
- **the EU Green Deal, Biodiversity strategy and Farm to Fork-strategy, all of which reflect public demands and are, from a scientific perspective, both justified and achievable under a proper policy design.**

We are concerned that a failure to deliver an improved CAP risks damaging:

- **the transitions of the farming sector:** Avoiding a necessary transition of the CAP toward prioritizing sustainable forms of agriculture puts the agricultural sector in a perilous situation in light of climate changes and environmental degradation (see Supporting Information #1) as well as socioeconomic changes (Supporting Information #2). Public spending should follow the precautionary principles of polluter-pay-provider-gets, and be guided by best available evidence to maximize the efficiency of public spending.
- **the security of planning for the farming sector:** If environmental regulations are postponed, they might come at a later stage and may involve fast and abrupt changes. Therefore, the business as usual-strategy of Council and Parliament puts the risk to the single farmer, who may have to adapt fast without transformation period.
- **the public's support for the CAP:** An increasingly polarized societal debate is damaging the reputation of farmers and places the CAP budgetary allocations at risk.
- **the European Union as a project itself:** The CAP's inadequate reflection of societal and environmental concerns (see also Supporting Information #3, "Lessons from the 2013 CAP reform") threatens losing public support and legitimacy. The European Union cannot afford for one of its largest policies to be ineffective, inefficient, and indifferent to societal concerns.

We call on European Union Member States, the Council and the Parliament to reconsider the CAP with a view to concluding the trilogue negotiations with a significantly stronger CAP, for the benefit of European farmers and the environment.

The scientific community stands ready to provide reasoned and documented evidence why maximising sustainable farming and minimizing, and gradually phasing out, support for unsustainable farming practices, offers a unique opportunity to farmers, consumers, the environment and, indeed, the European Union as a project.

With the trilogue negotiations ongoing, we are concerned that **none of the three proposals** - the Commission's, Council's and Parliament's – **aligns with the ambitious targets of the EU's Green Deal, Farm to Fork strategy and Biodiversity Strategy** (INRAE 2020). In fact, the proposed CAP is unlikely to meet even its own objectives (Navarro & López-Bao, 2019; Pe'er et al. 2019, 2020, Scown et al. 2020).

A critical evaluation of the **Commission's proposal of 2018** reveals some improvements but also a number of weaknesses and risks (Pe'er et al. 2019; Supplementary Information #4).

- The **new objectives** largely align with the UN's Sustainable Development Goals (SDGs), balancing social, economic and environmental objectives. These new objectives, though, are counteracted by the original ones of the Treaty of the Functioning of the EU (TFEU, 1957), especially the outdated priority to increase production.
- The **new implementation model** (or so-called 'delivery model') provides more responsibility and flexibility for Member States to fulfil the objectives. Yet without guidance, prioritisation, close monitoring and boundary conditions on environmental impacts, it allows Member States to choose a non-ambitious path.
- A new **Green Architecture** based on 'Enhanced Conditionality' and a new instrument of Eco-schemes in Pillar 1 that is designed to incentivise farmers to go beyond conditionality while not removing various weaknesses (see also Pe'er et al. 2019). Despite some merits, the proposed Green architecture has a range of weaknesses (see Supporting Information #4), due to which success can only achieved through great care for its details.

The Commission's 2018 proposal was recently complemented by the EU's Green Deal, Farm to Fork and Biodiversity Strategy, signifying high ambition of the new Commission under President von der Leyen. By contrast, the amendment proposals of the EU's Council (20.10.2020) and Parliament (23.10.2020) largely ignored the necessary changes to align the CAP with this strategic direction. As scientists, we are concerned that these proposals erode almost every single environmental instrument of the CAP. This backtracking risks to continue or even worsen the CAP's already-weak performance (Alliance Environment 2019, Scown et al. 2020) and threatens the sustainability of the EU's agriculture and the well-being of farmers and EU citizens.

II Key weaknesses and recommendations for improvement

1. Enhanced Conditionality:

GAEC 1 Weakness: While the Commission's 2018 proposal is deficient in not including a reference to grassland quality or ecologically sensitive permanent grasslands, the Council's and Parliament's amendment proposals weaken it further by allowing a conversion of permanent grassland into arable land (by altering the requirement for a constant ratio of grassland to agricultural area). Such conversion would be detrimental for biodiversity, climate mitigation and climate adaptation (e.g. Tsiafouli et al. 2015).

We recommend retaining the Commission's text proposal, or, better still, including a) an explicit requirement to protect ecologically sensitive permanent grasslands (especially in high nature value regions); and b) a requirement to retain or decrease grazing intensity, and/or prohibit intensification.

GAEC 2 weakness: While protecting and rewetting wetlands and peatlands can significantly reduce GHG emissions, the Parliament proposed replacing "protection" with "maintenance", which would enable maintaining poor management.

We recommend retaining the Commission's text proposal, "appropriate protection of wetland and peatland", accompanied by clear guidance as to the meaning of 'appropriate'.

GAEC 9 weaknesses: The Parliament's and Council's amendments

a) set the required share of non-proactive area at 3% or 5% (under discussion), in contrast to the 10% proposed by science (to restore pre-existing cover until the abolishment of set asides in 2008) and called for by the EU's Green Deal and Biodiversity Strategy;

b) replaced "agricultural" by "arable", thereby exempting 38% of the EU's agricultural area; and

c) propose to list production options (catch crops and nitrogen fixing crops) under this GAEC. This conflicts with the scientific evidence that demonstrates the criticality of non-production areas for biodiversity and ecosystem services that are essential for long-term production, climate change mitigation and pollution reduction (see Supplementary Information #1 below). These amendments not only weaken GAEC 9 but, in fact, reinstall the same production option which have led to the failure of Greening 2014-2020 (Hart 2015, Lakner & Holst 2015, Pe'er et al. 2014, 2017a,b, Alliance Environment 2019).

We recommend:

a) **setting GAEC 9 to 10% non-production areas including grassland (apart from extensive grasslands);**
b) **retaining the word "agricultural" rather than limiting GAEC 9 to arable land;**
c) **placing catch crops and nitrogen fixing crops in GAEC 7 ("no bare soil") and GAEC 8 ("Crop rotation"), in line with their main function and objective (soil protection).**

GAEC 10 weaknesses: The Parliament's and Council's amendment proposals alter the "ban on converting or ploughing permanent grassland in Natura 2000 sites" into "appropriate protection", or taking out the word "Natura 2000", or allow Member States to open the regulation under specific conditions. This contravenes the necessary expansion of protection measures for Ecologically Sensitive Permanent Grasslands beyond protected areas, as

recommended to Member States in the 2013 CAP policy. The ongoing degradation of grassland extent and quality in most Member States is driving significant losses of biodiversity, carbon-sequestration potentials, and climate-resistant (and resilient) land use.

We recommend retaining the Commission's text proposal for GAEC 10, or improving it by banning further management intensification especially in Ecologically Sensitive Permanent Grasslands, also beyond Natura 2000 sites. Optimally, the text should read: "Ban on converting, ploughing or intensifying management on permanent grassland in Natura 2000 sites and in Ecologically Sensitive Permanent Pastures".

2. Eco-schemes:

The objective of Eco-schemes was diluted by the Parliament's proposal for Eco-schemes to be in "*accordance with the specific objectives set out in points (a) and (b) of Article 6(1)*" (EP Article 28c), i.e., linking Eco-schemes to the income and competitiveness objectives. The latter can only be realized at the expense of sustainability criteria. This can lead to excluding non-productive landscape elements and extensive land-uses that are environmentally highly effective, in favour of ineffective measures. Noting that Objectives (a) and (b) already dominate the CAP's budget (72% of current budget), a further expansion of income-support into Eco-schemes may generate a risk of over-payment for ineffective environmental measures, and can even lead to supporting agricultural practices that already implemented by farmers with or without payments. All of this already happened with Greening and led to the failure Greening (Pe'er et al. 2014, 2017a,b, Hart 2015, Lakner & Holst 2015).

While the Parliament proposed an obligatory ring-fencing of 30% for Eco-schemes, the Council reduced the requirement to 20%. In both cases, the proposed rules are fuzzier, and the objective wider, which allows Member States to include irrelevant and/or inefficient Eco-scheme options.

The Council also added the objective of improving animal welfare in Eco-schemes. While welcome in principle, it can dilute environmental and biodiversity efficiency because animal welfare requires additional instruments, including more stringent regulations and labelling. In addition, the payments for animal welfare within the Eco-Schemes will most likely be linked to area, however the support of animal welfare (e.g. for the fulfilment of standards) is linked to the number of animal. In this specific case, payments linked to the number of heads or investment aids are much more efficient, so any payment per area will produce inefficient untargeted outcomes.

A proposed two-year transition period would allow the Member States to redeploy funds not used up by farmers in Eco-schemes for other purposes. This may erode Eco-schemes as well as the seemingly-ring-fenced budget, and allow temporary deregulation.

We recommend

a. **Ring-fencing at least 30% of Pillar 1's budget for Eco-schemes and restrict the possibility to reallocate unused funds to Pillar 2's environmental measures;**
b. **Removing the reference to income and competitiveness objectives;**
c. **Ensuring that eco-schemes include only effective and efficient environmental options, based on the robust foundations of agroecology and multifunctional**

agroforestry, while excluding ineffective, production-oriented options or other measures deprived of environmental benefits;

d. **Including a requirement for close consultation with scientists and other experts in Member-States' design of their Eco-schemes;**
e. **Close monitoring of the impacts of Eco-schemes and set requirements for re-adjustments where required.**

3. Green Architecture, the role of Areas of Nature Constraints (ANC) and the future of AECM:

The Parliament proposed to ring-fence environmental investments in Pillar 2 at 35% of its budget, while the Council proposed 30%. However, both the Parliament and Council propose to include both Agri-Environment-Climate-Measures and Areas of Nature Constraints (ANC) under this envelop, namely, to count ANC as part of the Green Architecture. Yet, ANC lack explicit environmental objectives, and essentially function as an income-support measure in Pillar 2 (Alliance Environment 2019). Thus, it is not justifiable to automatically count ANC into the environmental envelope without setting environmental criteria or require proven links to environmental benefits.

Notably, during the current (2014-2020) funding period, AECM (including organic farming) account for 21.9% of Pillar 2 funds, and ANC account for another 16.8%, i.e. a total of 38.7%. Both, the Parliament and the Council proposals therefore set a lower total budget for environmental objectives compared to now, while allowing ANC to compete with AECM and thereby damage the CAP's best instrument toward environmental objectives. Since over 72% of the UAA is eligible for ANC, including it into Green Architecture will dramatically erode the credibility of the CAP.

We recommend

a. **Retaining the Commission's 2018 proposal to shift ANC into Pillar 1, or tie ANC to environmental objectives, including strict monitoring and reporting criteria;**
b. **Ring-fencing the AECM budget;**
c. **Linking all AECM options to environmental, biodiversity and climate objectives, with additional incentives for measures that meet several objectives.**
d. **Setting high priority on retaining or expanding payments for AECM, organic farming, Natura 2000 (birds and habitat directive) as key environmental instruments of the CAP**

4. Maintaining ineffective or harmful subsidies

A main obstacle to achieving the goals of the Green Deal are the maintenance and, even worse, the relative expansion of Direct Payments. The amendment proposal to ring-fence coupled payments goes against scientific evidence, the EU's obligation to abolish harmful subsidies in line with the CBD's Aichi Target 3, and the declared CAP objectives.

In Article 86 4a, the Parliament has included the minimum share of 60% of Pillar 1 for Direct Payments, Coupled Payments and Redistributive Payments (current allocation is 68-70%

across all Member States). The 60% in Pillar 1 is limiting environmental investments by Member States to maximum 40% of the total budget. It further restricts other financial options and priorities such as the transfer of funds to Pillar 2 or the financial expansion of Eco-schemes. For instance, a 60% ring-fencing for Direct Payments will imply maximum transfer into Pillar 2 of a mere 20% of Pillar 2. This amendment therefore sets yet another restriction on environmental ambition, as well as on investments in rural areas.

This ringfencing proposal also undermines the new delivery model of the CAP, which puts more responsibility and flexibility to the Member States, and it counteracts the EU's goal to demonstrate global leadership in environmental protection.

We recommend

a. **Completely removing the ring-fencing for Direct Payments, Coupled Payments and Redistribution;**
b. **Introducing a proper monitoring and evaluation framework for Direct Payments to allow for transparent assessment of their impacts;**
c. **Cancelling the proposed amendment to set a minimum threshold for income instruments in Pillar 1;**
d. **Cancelling the barrier for transfers into Pillar 2, to allow Member States to offer greater support for rural areas and farmers therein.**

5. Capping instrument fails on farmers' needs and calls for improved equity

Beyond the environmental shortcomings, the CAP's core defect is the substantial **inequity of Direct Payment distribution among farmers**. 20% of farm holders receive over 80% of payments and, in fact, merely 1.8% receive over 30% of payments (European Court of Auditors 2020). The target of income policies is presumably to smooth an unequal income distribution among different farm types and sizes. Yet it can be hardly explained, how a highly biased distribution of payments could equalize such inequality (Scown et al. 2020). Furthermore, the experience of the recent CAP-period shows that voluntary redistribution rules did not change the distribution of Direct payments (Pe'er et al. 2017b). While economists recommend the phasing out of Direct Payments as a highly inefficient and poorly-justified instrument, and farmers have rightly called to rectify the biased distribution of these payments, these have been ignored in favour of a vote by both the Parliament and the Council to make the "capping and redistribution" mechanism voluntary for Member States. With more than 60% of the CAP's budget allocated to income support, it is unacceptable that the proposed CAP will either retain or aggravate the poor performance regarding its own best-funded objective (Pe'er et al. 2019).

In light of the political priority for retaining Direct Payments while trying to improve their distribution to achieve a fairer CAP, **we recommend (as second best) to make the Capping, Degressivity and Redistribution mechanism obligatory for all Member States, and to set strict capping rules.**

6. New Delivery Model and Strategic Plans

While the 'new delivery model' offers Member States greater flexibility to choose their implementation path and focuses on strategic plans and monitoring of performance, the

Council and Parliament rejected amendment proposals to link the targets with the EU's Green Deal, Biodiversity, and Farm to Fork strategies. The Council further proposed reducing the reporting requirements for result indicators, thereby jeopardizing transparency and accountability. Additionally, the Parliament has introduced a rule (Art.12), specifying that member states cannot formulate environmental requirements beyond those (diluted) formulated in the GAEC-rules. This amendment restricts the responsibility and flexibility of Member States, contrasting the spirit of the proposed delivery model.

The amendments are in contrast to repeated calls, and a range of proposals, to improve the CAP governance (e.g. Nicholas 2019, Pe'er et al. 2019,2020).

To ensure the success of the new Delivery Model, **we recommend**

a. **integrating the EU's Green Deal objectives with the CAP Strategic Plans already in their adoption phase;**
b. **retaining the yearly reporting of all Result indicators;**
c. **establishing and strengthening the management, monitoring and evaluation capacity in regional authorities; and**
d. **improving the integration of scientists and other experts in the consultation processes offered by Agricultural Knowledge and Innovation Systems (AKIS).**

As part of the new 'structured dialogue', we further recommend the Commission to disclose the recommendations sent to each Member States during the preparation of the CAP Strategic Plans, as well as to a-priori publish the criteria for assessment and approval of the Strategic Plans.

We further recommend the Commission to support the Member States' use of Geographical Information Systems analyses and other bio-physical criteria when prioritising the assessed needs and setting up the targets of the CAP Strategic Plans.

Seen together, the total investments in environmental protection will seriously decline if the amendment proposals of the Council and the Parliament are realised, especially if Areas of Nature Constraints are included as an instrument without proven beneficial effects on the environment. This would stand in contrast to the postulated greener and fairer CAP.

We recommend all Trilogue members to proof-check how CAP investments demonstrate a real, and measurable, increase in ambition compared to now.

III Political position set the CAP and the EU at risk

The proposed amendments do not support the indispensable transformation of the EU's farming sector in view of both the climate and biodiversity crises and the complex set of challenges for sustainability. The justifications provided to support the position of the Council and Parliament are using misleading arguments on global food security and, on the other hand, disregarding the documented evidence of multiple environmental problems and associated risks for farming. The Council and Parliament proposals prioritise production- and food-security without scientific grounds, and they ignore numerous science-based scenarios for a smooth transition towards more sustainable farming.

If carried through, the CAP would continue to benefit a small number of recipients (mainly large-scale land owners), without improving the delivery of public goods, the livelihoods of a majority of smallholder farmers and rural areas, or the added value of the CAP as a core EU policy.

- **Claims that the CAP must aid production** in light of global food security issues: This argument has been outdated for decades. Sound scientific evidence shows that food security is mostly a matter of food distribution, income levels of consumers, food waste, and distorted market incentives (e.g. for bioenergy and animal-based products). More land is used for animal feed and bioenergy production than for producing plant-based food directly for human consumption. Thus, while global food security is undoubtedly important, the current narrative - especially for Europe where over-production and food waste are greater challenges - misleads the public (see also Pe'er & Lakner 2020a).
- **Positioning nature conservation against farmers, production and income** is an outdated approach, considering the proven synergies between resource conservation functional biodiversity and both the yield stability and long-term production capacity of land. Especially because environmental sustainability benefits producers and the public at large, farmers should be supported in achieving it.
- **Claims of conflicting objectives** are contradicted by an increasing number of farmers who are committed to, and already engaging in more environmentally-friendly practices and who call for better public policies to support them. Ill-designed measured and funding, rather than lacking CAP instruments prevent the support of farmers' provision of public goods. The exceptional importance of the economic and social dimensions of the CAP call for higher prioritization of Pillar 2 and its support of a large variety of rural development that would yield well documented benefits to multiple actors. This, rather than retaining Direct Payments at all costs, is supported by science and expected by the public of a reformed CAP. The positions of Council and Parliament maintain the economic disadvantages of farmers, who already picked up the challenge to simultaneously contribute to production and environmental services.
- **Placing highest priority on production** does not justify retaining the CAP. Sufficient production can be secured without subsidies through a well-functioning market.

In conclusion, science support the concerns expressed by the Commission and by farmers and civil society. The current CAP reform will not support sustainable agriculture; nor will it meet its own declared objectives. Instead, the CAP may well perpetuate the problems it claims to address and, in the process, polarize the societal debate around agriculture, and derail the ambitious objectives set by the EU's Climate Law, the Green Deal, Farm to Fork strategy and the Biodiversity strategy.

Scientists have called for realistic actions for climate mitigation (Hagedorn et al. 2019), for agriculture (IPBES 2018) and for the CAP (Pe'er et al. 2020). Unfortunately, these reasoned analyses have been so far ignored by the Council and the Parliament. Short-sighted political compromises have resulted in a "lose-lose" package, whereas a **win-win option, which benefits farmers as well as the environment, remains feasible and desirable, and could help regain the public's trust in the EU. This opportunity should not be missed.**

IV Supporting Information for our recommendations

#1: Global Environmental Crises and Agriculture

Many of the current agricultural practices are detrimental for the environment (Ramankutty et al. 2018, Tamburini et al. 2020). A substantial progress has been made in developing more sustainable agronomy for all farming systems in the EU, and CAP instruments are available to support these, especially through its Rural Development Programmes (Pillar 2). The CAP has the instruments to redress harmful impacts and pave the way for sustainable agriculture. However, so far, the CAP did not sufficiently upscale existing knowledge and effective instruments and start a large-scale sustainability transformation. In consequence, the CAP support did not reverse the continued environmental degradation.

Biodiversity: Intensive agriculture in most forms negatively affects biodiversity. At the same time, agricultural yields critically depend on biodiversity and multiple ecosystem services.

The European Environmental Agency (EEA 2020) highlights agriculture being the key driver of biodiversity loss across the EU. The IPBES Global Assessment (IPBES 2019) and Assessment of the German Academy of Sciences Leopoldina (2020) ascertain that farming with high inputs of fertilizers and pesticides, missing structural and crop diversity in increasingly monotonous agricultural landscapes are responsible for biodiversity loss (Sánchez-Bayo & Wyckhuys 2019). Biodiversity loss is closely linked with the breakdown of ecosystem services essential to agricultural production (such as pollination, pest-control, nutrient recycling, soil fertility and climate regulation; IPBES 2018), as well as cultural services central to rural viability (such as landscape amenity and tourism). Several evaluations of the CAP highlight its low performance due to poor policy design and low priority setting for most efficient instruments (Alliance Environment 2019, ECA 2020). In addition, biodiversity loss is related to the abandonment of agricultural land, due to structural changes that the CAP is failing to address as well.

Climate Change: Agriculture is a major contributor to climate change, and agricultural production itself is strongly affected by these changes. Agriculture, together with land use, land use change and forestry (LULUCF) accounts for about 10 % of the direct GHG emissions reported by the EU, dominated by emissions from animal production, nitrogen fertilizers, and CO_2- and CH_4-releases through mismanagement of peatlands and wetlands (Eurostat 2019). Yet, these numbers do not account for indirect contributions coming from irrigation, machinery, product-processing, packaging and shipping as well as externalization of land-use changes outside of Europe (Pe'er & Lakner 2020b). The latter is particularly worrying as it drives rapid destruction of rainforests and other natural ecosystems for commodities such as soy, beef or palm oil (e.g. Rajao et al. 2020). At the same time, climate change poses a major threat to agricultural production and food security, especially via the increased frequency of extreme weather events such as extended droughts, heat waves, or floods. As examples, the exceptionally wet season in 2017 and severe droughts in 2018 and 2019 inflicted severe

economic losses on farmers and forestry. Climate stability and sustainability of agricultural production go hand in hand.

Nutrient flows: Intensive specialised animal husbandry and overuse of fertilisers result in nitrate and phosphorus leaching into surface- and groundwater, and NH4 and N2O emissions into the atmosphere. Nitrate pollution bears direct costs in cleaning drinking water (Pretty et al. 2000, Sutton et al. 2011), and impacts human health, fisheries and tourism (FAO 2019). The emission target for nitrogen in ground- and surface water remains unmet (Directive 91/676/EEC). Globally, human interference with the nitrogen cycle due to agriculture has exceeded the planetary boundaries (Rockström et al, 2009, Campbell et al. 2017). Phosphorus is a strategic, non-renewable resource, loss of which has immense implications for food security, while eutrophication adversely affects aquatic ecosystems (SRU 2004: fig. 189/190).

Soil and water degradation: Loss of key environmental resources caused by intensive agriculture, such as soil and water degradation, poses a key risk for yield stability, economic viability, and the maintenance of various ecosystem services. Management associated with the prevalent monocultures (annual ploughing, lack of soil cover, rest periods of fallowing or cover crops, and use of heavy machinery) (Kremen & Merenlender 2018), some widely-cultivated crops such as corn contribute to soil erosion and compaction (FAO et al. 2020, Panagos et al. 2016), as well as higher GHG emissions and soil biodiversity loss. Monocropping makes crops vulnerable to weather extremes and pest outbreaks. Bare soil, large field sizes and poor farming practices can contribute to soil erosion as well. In the long term, soil loss and degradation endanger agricultural production, food security and farm viability.

A disproportional support to livestock production. Currently, the CAP supports livestock-production disproportionally to their overall agronomic or social wellbeing benefits through direct payments and, particularly, coupled payments. Specialised large-scale livestock production is incompatible with agronomic benefits of livestock (such as biodiversity, nutrient cycling, ability to utilise wastes and non-arable land), animal welfare (e.g. Tilman & Clark 2014; Potter, 2017; Clark et al. 2019). Consequently, relatively low costs of animal-derived products jeopardise healthy and low-emission diets. The role of the CAP should be to support a transition to more plant-based farming-systems and diets in a process fair to producers.

#2: Socio-Economic Challenges in the Agricultural Sector

The agricultural sector is largely affected by rapid technological improvements and structural change. Immobile production factors and decreasing prices during a long time period are causal to economic pressures and to substantial structural changes in the sector. The phenomena drive rapid enlargement of farms and further increase of technology, energy and other resources use. This positive feedback loop, known as the “technological treadmill” (Cochrane 1958), is rather independent of the CAP, however, practically accelerated by it through various funding mechanisms.

The CAP-reform 1992-2003 liberalized its market-policies and successfully reduced harmful effects. EU agricultural prices are nowadays much closer to the world-market prices with a number of positive effects for farmers and society. However, liberalized markets are also a challenge for farmers, since they have to cope with market and price risks.

Socio-economic challenges to achieve sustainability range from high competitiveness among farmers, benefiting economically stronger farmers, creating high inequity in income and market access, to low revenues because of weak bargaining positions. While a range of CAP instruments aim to address these challenges, they are counteracted by Direct Payments that are prioritized over greater support for structural issues and that favour larger over smaller recipients. These preserves or even increases inequities, rather than reducing them (Scown et al. 2020). Consequently, the number of farmers continues declining also under CAP support.

Shortcomings of the CAP in addressing socio-economic challenges are:

1) Absence of a sound justification for Direct Payments, the key instrument designed to address farm income. Neither the EU Commission nor the agricultural ministries have proven that agricultural households are per se poorer than other households, i.e. justifying a specific income policy. Furthermore, the distribution is largely unequal and perceived as unfair. Thus, instead of decreasing inequity in the sector, a per-hectare payment benefitted large farmers disproportionally. Neither "capping", nor "degressivity" or "redistribution", has successfully addressed inequities in the sector. Furthermore, landowners and land tenants, not active farmers, are profiting from direct payments (via increased rental payments). Thus, **direct payments enhance, rather than decrease, income inequity** (Scown et al. 2020).
2) A key narrative to justify the CAP concerns the importance of rural areas. However, budgets to support rural areas are decreasing. Furthermore, co-funding requirements also deter (especially poorer) Member States from investing into Rural Development Programmes - although Pillar 2 instruments are well equipped to deal with both environmental and social sustainability challenges (Nicholas et al. 2019).
3) Approximately 11% of the CAP is invested in ostensible support of competitiveness. Yet, these measures are also highly contentious and studies have demonstrated that investment support is inefficient (Brümmer & Loy 2000).
4) There is too little systematic targeting towards poorer regions within the CAP. While the CAP is claiming to support rural areas, financial resources of the current CAP mostly benefit richer regions within the EU (Scown et al. 2020).

Societal debate: Because of missing reforms in the sector and increasing public awareness of the environmental problems, many citizens criticise farmers practicing intensive farming systems and expect changes toward sustainability (Mupepele et al. 2019, Bieling et al. 2020). However, for a long time, farmers have followed the productivity objective of Art 39, causing a number of problems. Farmers follow control and funding measures within the CAP, mainly taking business-as-usual policy with high environmental and social costs. Thus, the public critique is perceived as unfair and creates frustration among farmers, who themselves have a key interest in sustaining their natural resources and thus their income on the long run.

Therefore, a reform of the CAP can help increase acceptance and design the CAP in a manner suited to support a shift to sustainable farming. An ongoing polarization is fed by misinformation and misinterpretation of causes and consequences. This adds a challenge for farmers to explain and communicate their own business. Utilizing the momentum in civil society, combined with the urge to act now for a more sustainable future, could thus address environmental and social aspects of the agricultural crisis at the same time.

#3: Lessons from the CAP reform of 2013

Many measures to combat adverse environmental impacts and to adapt agricultural practices to environmental hazards are available in designated CAP instruments, such as Cross Compliance and Agri-Environment-Climate-Measures (AECM). However, the CAP falls short of prioritizing the relevant instruments and solutions and sufficiently incentivising farmers in adopting them on a large scale (Díaz & Concepción 2016, Pardo et al. 2020). Some of the CAP's shortcomings have been addressed in 2013, with the establishment of Greening measures to strengthen the environmental performance of Direct Payments, as well as a Capping and Redistribution mechanism to address their inequitable distribution. However, built-in policy design failures have impeded progress.

- The greening measures were weakened by broad exemptions (>50 UAA and around 90% of farmers), low requirements, and lack of habitat-quality related criteria (Pe'er et al. 2014, Díaz & Concepción 2016). The inclusion of production-oriented options, which are attractive but ineffective for biodiversity, dominated the implementation of Ecological Focus Areas (Pe'er et al. 2017a; Alliance Environment 2019, ECA 2020). Consequently, the vast majority of farmers were either exempt from greening or could easily meet the requirements without changing their farming practices or improving environmental conditions.
- The incorporation of greening and inclusion of additional options but lower budgets eroded Agri-Environment-Climate-Measures (AECM) in Pillar 2 (Rural Development Programmes) – a much more effective instrument compared to greening (see e.g. Batary et al. 2015). In Austria, for example, this has led to overall detrimental impacts on the environment and biodiversity compared to the previous CAP funding period (Kirchner et al., 2015, 2016; Sinabell 2018; Sinabell et al., 2019). The Court of Auditors recently confirmed that the most effective and thus useful measures supporting and enhancing biodiversity are AECM, payments for organic farming and Natura-2000 payments (ECA 2020). There are methods to implement Natura 2000 by means of targeted AECM (Lakner et al. 2020). In real terms, financial funds for AECM have stagnated on 4% to 6% of the CAP's share since the year 2000. With insufficient budgets, high bureaucratic hurdles (Brown et al. 2020) and the burden of co-funding by Member States, the 2013 reform did not succeed in upscaling good agricultural practices.
- There is a glaring lack of evidence for the effectiveness of Direct Payments as a sustainable public policy, even as an income support tool (WBAE 2010, 2018, 2019). They have been originally installed as a temporary instrument (Matthews 2017). Despite these, the budgetary allocations for Direct Payments were not only continued but expanded in the last reform, partly using the Greening as a justification. Since Greening has failed, so the justification.
- Furthermore, while Coupled Payments have been gradually phased out until 2012, they increased following the 2013 reform from 4% of Pillar 1 in 2012 to 15% by 2020. These payments are linked to specific, frequently intensive types of production. They distort production decisions and markets, and can be criticised from an economic perspective (Matthews 2015, 2020). However, they also have negative side effects for the environment, as they often increase GHG emissions (Jansson et al. 2020). The EU's most "harmful subsidy" (Schmidt 2007), which should have been eliminated, has expanded in the last reform.

We learned from the 2013 reform that the key reasons for the CAP's failure on environmental criteria were: a) setting budget priorities that benefit only one CAP objective (income support) against all others (Pe'er et al. 2019), and b) allowing Member States the freedom to choose among options but not creating a legal environment, in which they would be forced to balance the realisation of environmental targets with an easy administrative implementation and high-income effects for the farmers. In the given framework, all Member states opted in varying degrees for the easy option pleasing the farming community.

Notably, diluting the (initially ambitious) proposal of the Commission occurred during the final negotiation stages, namely the Trilogue (Hart 2015).

#4 Weaknesses of the Commission's CAP proposal of 2018 on the Green Architecture

1. Greening elements have been moved to Enhanced Conditionality or Eco-schemes, however without more ambitious environmental goals and design (i.e., regional targeting, landscape-scale design, and customary monitoring and re-evaluation).
2. Expanding protection for Ecologically Sensitive Permanent Grasslands and High Nature Value farmlands has been left out.
3. The overall combination of elements to expand environmental ambition while retaining freedom for farmers is not binding for Member States, and may erode Agri-Environment-Climate-Measures (AECM) and payments for Natura 2000.
4. Insufficient monitoring, inappropriate indicators (ECA 2016) and limited impact of sanctions (Pe'er et al. 2017b and references therein) have led to low levels of compliance with the Cross Compliance mechanism (see also Alliance Environment 2019). As this has not been rectified, Enhanced Conditionality may have little impact on farm management.
5. With Art. 10 the EU intends to introduce the Eco-scheme payments to the World Trade Organization's (WTO) Green Box (Annex 2 WTO agreement on Agriculture). While limiting market distorting effects of the Eco-Schemes, this strategic step prevents the financial support of low-input types of farming systems by the MS in order to raise their profitability (a basic requirement of Annex 2 for any support exceeding income foregone or cost incurred is the "No link to production" obligation).
6. If the legal framework and the guidance for Eco-schemes remain insufficient, and funding for unsustainable farming and (agro-)forestry systems remains stable, the goals of reversing environmental degradation and biodiversity declines, and reducing agricultural GHG-emissions may not be achieved.

Beyond these weaknesses, the CAP proposal lacks a mechanism to sensibly quantify the environmental ambition level. The amount of money spent is not a smart indicator if some elements can have an unlimited income component

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