

Action needed for the EU Common Agricultural Policy to address sustainability challenges

Guy Pe'er^{1,2,3,*}, Aletta Bonn^{1,2,4}, Helge Bruelheide^{5,1}, Petra Dieker⁶, Nico Eisenhauer^{1,3}, Peter H. Feindt⁷, Gregor Hagedorn⁸, Bernd Hansjürgens^{2,5}, Irina Herzon⁹, Angela Lomba¹⁰, Elisabeth Marquard², Francisco Moreira^{10,11}, Heike Nitsch¹², Rainer Oppermann¹³, Andrea Perino¹, Norbert Röder¹⁴, Christian Schleyer¹⁵, Stefan Schindler¹⁶, Christine Wolf², Yves Zinngrebe¹⁷, Sebastian Lakner¹⁴ and X additional signatories (see Supplementary Information¹)

Affiliations:

- 1) German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig, Deutscher Platz 5e, 04103 Leipzig, Germany
- 2) Helmholtz Centre for Environmental Research - UFZ, Permoserstr. 15, 04318 Leipzig, Germany
- 3) University of Leipzig, Deutscher Platz 5e, 04103 Leipzig, Germany
- 4) Friedrich Schiller University Jena, Institute of Biodiversity, Dornburger Straße 159, 07743 Jena, Germany
- 5) Martin Luther University Halle-Wittenberg, Große Steinstraße 73, 06108 Halle/S., Germany
- 6) Thünen Institute of Biodiversity, Bundesallee 64, 38116 Braunschweig, Germany
- 7) Humboldt Universität zu Berlin, Thayer Institute for Agricultural and Horticultural Sciences, Agricultural and Food Policy Group, Unter den Linden 6, 10099 Berlin, Germany
- 8) Scientists for Future, Berlin, Germany
- 9) University of Helsinki, Department of Agricultural Sciences and Helsinki Institute of Sustainability Science, HELSUS, P.O. Box 27, FI-00014, Helsinki, Finland
- 10) CIBIO-InBIO, University of Porto, Campus Agrario de Vairao, 4485-601, Vairao, Portugal
- 11) CIBIO-InBIO, University of Lisbon, Institute of Agronomy, Tapada da Ajuda, 1349-017 Lisbon, Portugal
- 12) Institute for rural Development Research, Kurfürstenstr. 49, 60486 Frankfurt a. M., Germany
- 13) Institute for Agroecology and Biodiversity (IFAB), Boecklinstr. 27, 68163 Mannheim, Germany
- 14) Thünen-Institute for Rural Studies; Bundesallee 64, 38116 Braunschweig, Germany.
- 15) University of Innsbruck, Institute of Geography, Innrain 52f, 6020 Innsbruck, Austria
- 16) University of Vienna, Division of Conservation Biology, Vegetation and Landscape Ecology, 1030 Vienna, Austria.

¹ signatures are currently being collected through our website, www.idiv.de/de/cap-scientists-statement. The list will be added as an SM upon publication.

17) Georg-August-Universität Göttingen, Department for Agricultural Economics and Rural Development, Platz der Göttinger Sieben 5, 37073 Göttingen

* corresponding author. Email: guy.peer@idiv.de

Word count: 2101 (excluding acknowledgements and references)

Abstract

Making agriculture sustainable is a global challenge. In the European Union (EU), the Common Agricultural Policy (CAP) is failing with respect to biodiversity, climate, soil, land degradation as well as socio-economic challenges especially in rural areas. The European Commission's proposal for a CAP post-2020 allows Member States to choose low-ambition implementation. With a new Parliament and Commission in place, the reform process has now restarted. It is therefore time to act on urgent challenges and address citizens' demands for sustainable agriculture, using the full breadth of available scientific evidence and knowledge. Concerned about attempts to dilute the environmental ambition of the future CAP, we call on the European Parliament, the EU's Member States and the European Commission to adopt ten urgent action points for delivering sustainable food production, biodiversity conservation, and climate mitigation towards an evidence-based, future-proof European agriculture.

Keywords: Agriculture, biodiversity, Common Agricultural Policy, climate change, evidence-based policy, public goods, sustainability

Agriculture is a main driver of environmental degradation in Europe

Agriculture is a key driver for biodiversity and ecosystem services loss as well as climate change (Diaz et al., 2019, IPCC, 2019). While historically some agricultural practices supported biodiversity and the delivery of multiple ecosystem services, these have been increasingly abandoned or replaced by intensive and unsustainable farming systems. The European Union's (EU) Common Agricultural Policy (CAP), which shapes the European agricultural sector (Hodge et al., 2015), supports farming practices which contribute to biodiversity loss (Pe'er et al., 2017, 2019), climate change (European Commission, 2019), soil erosion (Orgiazzi et al., 2016) and land degradation (IPBES, 2018). CAP instruments that could counteract these developments are insufficient (European Commission, 2019; Pe'er et al., 2019). Furthermore, the current CAP is inefficient and ineffective also in addressing the social and economic challenges of rural communities (Pe'er et al., 2017). The EU Commission's proposal for the post-2020 period (European Commission, 2018) offers Member States the option to implement ambitious environmental instruments, but its vague formulation and extended flexibility also enable unambitious national implementation - a path taken by many Member States during the current period (Pe'er et al., 2017, 2019; WBAE, 2019).

Reasons for concern

The CAP post-2020 as proposed by the European Commission (European Commission, 2018) addresses environmental and sustainability challenges inadequately (CEJA et al., 2019; Pe'er et al., 2019; WBAE, 2019), and making a business-as-usual scenario very likely. Key shortcomings in the Commission's proposal include:

- **Continuation of subsidies through area-based 'Direct Payments' (in so-called Pillar I) with low levels of environmental requirements**, despite the fact that they inefficiently address their supposed aims and are often passed on to non-agricultural land owners and industries. 'Capping' and redistributing direct payments is likely neither to achieve a more equitable distribution (Matthews, 2018a) nor to justify the continued existence of direct payments.
- **Budget cuts for Rural Development Programmes (so-called Pillar II), including agri-environment-climate measures**. Wherever designed and implemented well, policy tools under Rural Development Programmes have been shown to be effective to support both pro-environmental farming practices (Pe'er et al., 2017) and rural development. The proposed budget cuts are therefore counterproductive (CEJA et al., 2019).
- **Misleading claims and insufficient effort to reduce greenhouse gas emissions**. The Commission labels 40% of the expenditures for direct payments and payments for 'natural or area-specific constraints', as "climate-friendly". Yet these instruments are not systematically linked to any effective measure for greenhouse gas reduction or adaptation. Instead, they partly support practices and sectors with significant greenhouse gas emissions (Pe'er et al., 2017; European Commission, 2019).
- **A "green architecture" with vague requirements allows Member States and farmers to choose unambitious ('light green') options** (see Supporting Materials in: Pe'er et al., 2019). The Commission's proposal presents a new, voluntary-based instrument ("eco-schemes") and a slightly expanded set of environmental conditions for direct payments. However, the proposal fails to enlist concrete measures that are essential for benefitting biodiversity and the environment (e.g. extensive

arable land, high-diversity grasslands and, at the landscape scale, High Nature Value farmland and mosaic landscapes), and the management requirements for non-productive options (e.g. fallow land or buffer strips) are too vague. While flexibility to address context-specific challenges is reasonable, the experience of past and current CAP cycles is that vagueness encourages a 'race to the bottom' where Member States 'compete' for the lowest requirements for their farmers' direct payments. A proposed 'performance bonus' may fuel such a race by incentivising Member States to set easy-to-achieve targets from the onset.

- **Insufficient set of indicators** (Annex I of European Commission, 2018). The planned "output" and "results" indicators mainly monitor administrative and financial implementation, while the proposed impact indicators are largely vague, tautological or incomplete. Indicators are lacking with respect to farm management, land-use changes, environmental parameters and the economic performance of farming households, to name just a few. This stands in stark contradiction to the result-based principles that the next CAP claims to follow. Moreover, the simplistic form of most proposed indicators and their expected complex administrative burdens set major hurdles to ambitious environmental implementation by Member States (WBAE, 2019).
- **No obligation to invest in risk management and mitigation.** Extending risk management tools (i.e. insurance; article 70 in European Commission, 2018) seems reasonable given the increased risks to farmers from market exposure, climate change (especially extreme weather events such as heat, droughts and wildfires), and sanitary or phytosanitary hazards. However, without requiring proper risk mitigation measures, such insurance may promote risk-prone behaviour, i.e. ignoring avoidable risks (Müller, Johnson, & Kreuer, 2017).
- **Lack of policy consistency.** The proposed CAP post-2020 repeats the heavily criticised procedure of restructuring and renaming CAP elements in a way that impedes learning and undermines transparency and legitimacy (Rutz, Dwyer, & Schramek, 2014; Erjavec & Erjavec, 2015; WBAE, 2019).

While the Commission's proposal for the CAP post-2020 is already weak, there is pressure to water down further the environmental requirements. This includes the proposed amendments by the European Parliament's Committee for Agriculture and Rural Development (COMAGRI, 2019), as well as a proposal from the EU's Council (representing the Member States) to reduce or remove many environmental requirements (Council of the European Union, 2019). These proposals indicate that, as in the previous reform cycle (Pe'er et al., 2014), a closed institutional process is used to defend the interests of few winners at the expense of broader public concerns (Erjavec & Erjavec, 2015), largely disregarding the evidence supporting a policy change.

Therefore, we call for the breadth of scientific knowledge to be used for informing and improving the CAP, and to avoid policy failure and the further ineffective use of taxpayers' money. With a new Parliament and Commission in place, and a CAP reform to conclude, we see a critical opportunity for the European Institutions to act towards an evidence-based and future-proof CAP.

Ten urgent action points

1. Use multi-functionality, public goods and public services as guiding principles for CAP design. Not only public consensus, but also numerous EU and international commitments compel agriculture to contribute to climate change mitigation, the protection and restoration of soil and biodiversity, and

the protection of water. This requires removing harmful subsidies (particularly Coupled Direct Payments for intensive production systems), expanding support for pro-environmental practices in both CAP Pillars, and improving instruments to enhance the viability of High Nature Value farming systems (Oppermann, Beaufoy, & Jones, 2012; Keenleyside et al., 2014; EIP-AGRI Focus Group, 2016).

2. Phase out Direct Payments by 2030, given their poor performance for both income and sustainability aim. Meanwhile, all payments should be made conditional on higher environmental standards; flexibility to transfer budgets into Pillar 2 enhanced; and at least 30% of direct payments ring-fenced for effective measures under eco-schemes to ensure the provision of public goods (see also point 5 below).

3. Increase budgets for effective instruments to address climate change. Agricultural sources of greenhouse gases need to be reduced, especially in livestock husbandry, nitrogen fertilizer application, and maladapted land-use on bogs, fens and organic soils. Insurance against climate-related risks should link to tangible risk mitigation measures for droughts, fires, floods, soil losses and carbon releases. Linking insurance to nature-based solutions can be achieved by combining risk management with agro-environmental policies, to encourage farmers to adopt better practices.

4. Demand Member States to set clear, adequate, measurable and time-bound targets in their strategic plans in order to fulfil all CAP objectives including biodiversity protection, climate action and development of rural areas. Member States should be obliged to demonstrate how they address trade-offs between objectives (see Supplementary Material in: Pe'er et al., 2019). This will require guidance by the Commission, as well as close monitoring of implementation and outcomes.

5. Provide sufficient support for effective biodiversity and climate protection, e.g. the maintenance of non-productive areas (at least 10% as required until 2008), supporting extensive grazing, rewetting peatlands and organic soils, and supporting arable production without chemical fertilisers or pesticides. To this end, it is essential to allocate sufficient budget, both in the Pillar 1 (for eco-schemes) and in Pillar 2 (for agri-environment-climate measures), to meet legal obligations and political targets on environmental, resource, climate and public health protection. This requires a focus on supporting efficient (so-called 'dark green') measures, and a coherent and synergistic policy design across pillars (e.g. Lakner et al., 2018).

6. Support innovative methods of agri-environmental support, such as result-based remuneration of agri-environmental measures, e.g. oriented to target species or habitats (Herzon et al., 2018), collective measures to support landscape-level management (see below), or the introduction of a points system to increase farmers' benefits proportionate to ambition and/or investments as also proposed by several farmer organizations (e.g. Neumann, Dierking, & Taube, 2017).

7. Apply a landscape-level perspective. Several integrated landscape management and collaborative implementation of environmental measures by farmers have shown to be successful (Westerink et al., 2017). Further policy experiments are urgently needed with a view to adopt programs for integrated landscape- and resource-management in both pillars. Such approaches should entail longer-term contracts with farmers to improve income security and ecological benefits. A landscape-level perspective would allow for local targeting of management measures that can achieve a more effective delivery of public goods such as maintaining water quality (Jones et al., 2017) and reducing fire hazard (Moreira & Pe'er, 2018).

8. Revise the set of indicators. Implementing a result-based approach requires both result and impact indicators to be adequate and meaningful. Critically, the indicator of High Nature Value farming

reintroduced and improved. To reduce complexity, financial reporting and reporting for sustainability indicators should be separated.

9. Strengthen environmental monitoring and enforcement. Yearly monitoring (e.g. using the EU's reporting system to account for yearly changes in land-use/cover and management) is needed to enable policy makers and landowners to react promptly to developments, provide incentives and placing efficient sanctions to avoid spending payments without proper evaluation of effectiveness and efficiency.

10. Integrate the EU's principle of "Policy Coherence for Development" (PCD) more strongly by taking into account environmental leakage and land-use effects outside the EU (Matthews, 2018b). This can be done, for instance, by supporting greater self-sufficiency and communicating about sustainable consumption levels that reflect Europe's and global capacity. The EU needs to strive for a better understanding of the connected impacts on developing countries' ability to meet the SDGs, resulting from agricultural payments (Yang et al., 2018) and unsustainable imports, especially of animal-derived products, feed and biofuel contributing to tropical deforestation, biodiversity loss, and increased greenhouse gas emissions in developing or transitioning countries (Barthel et al., 2018; Schulmeister, 2015; Matthews, 2018b).

Beyond these ten action points, in the sake of transparency and legitimacy it is essential to enable public scrutiny of CAP-reform negotiations and implementation, throughout the policy cycle. This entails opening negotiation- and implementation-documents for evaluation, and making data accessible regarding how public money is used.

Overall, the breadth of existing knowledge, best-practice examples, decision-support tools and scientific evidence should be integrated more effectively into the CAP design and implementation, in a way that acknowledges and addresses the expectations of European citizens, the multi-functionality of agricultural lands, the diversity of affected stakeholders, and all three dimensions of sustainability – social, economic and environmental.

The European Commission, Council and Parliament need to take ambitious and responsible actions

Sustainability is a top societal priority and an urgent challenge, both in Europe and globally. It is enshrined as a goal in the Treaty of the European Union (European Union, 2016). Given the pressing sustainability challenges, and the poor performance of the CAP, business as usual is not an option. Urgent and efficient actions are needed to ensure environmental sustainability and long-term food security. Failure to act on climate change, soil degradation and biodiversity loss would be irresponsible toward current and future generations (Hagedorn et al., 2019).

As the CAP reform process progresses, it is critical to reflect on the unequivocal scientific evidence behind the demands made by civil society to orient the CAP toward environmental and social sustainability targets. The new Commission President Ursula von der Leyen has announced a so-called "Green Deal" that should include a "Farm to Fork Strategy' on sustainable food" (von der Leyen, 2019). Directing the CAP toward effective support for farmers in adapting to the sustainability challenges can serve as a landmark for the new commission to prove its sustainability ambition, yet it requires political courage to move out of business-as-usual. We therefore call on the Commission, Parliament and Council to fulfil their responsibility to safeguard Europe's agricultural systems, landscapes and people

by ensuring a high level of environmental and climate protection, investing in healthy food and diverse landscapes, and promoting rural vitality and citizens' wellbeing.

Acknowledgements

This position paper has benefitted from two expert workshops in November and December 2018, one within the project INTERNAS funded by the Helmholtz Association, and one through the sDiv project "Towards the next reform of the EU's Common Agricultural Policy: evaluating the new greening measures from Ecological and Socio-economic perspectives" awarded to GP, AB and BH by the German Centre for Integrative Biodiversity Research (iDiv) Halle-Jena-Leipzig (DFG FZT 118). We thank Elisa G. Schütze for the collation of inputs from workshop participants, and for preparation of text material contributing to this paper. NE acknowledges funding by the European Research Council (ERC Starting Grant 677232, ECOWORM). FM was supported by FCT (contract IF/01053/2015). AL was supported by national funds through FCT – Fundação para a Ciência e a Tecnologia, I.P., in the context of the Transitory Norm - DL57/2016/CP1440/CT0001. All authors contributed to the manuscript and gave their approval for its submission.

Supplementary Information: List and affiliations of signatories will be provided upon publication

References

- Barthel, M., Khor, Y., Jennings, S., Sheane, R., Fry, J., Schreiber, W., Royston, S., McGill, J., 2018. Study on the Environmental Impact of Palm Oil Consumption and on Existing Sustainability Standards. doi:10.2779/530244
- CEJA, CEPF, CIC, Copa/Cogeca, ELO, FACE, UECBV, 2019. Rural Coalition Statement: Empowering rural areas in the CAP post-2020. Available at <http://www.ceja.eu/cutting-rural-development-funding-next-cap-makes-no-economic-environmental-political-sense/>
- COMAGRI, 2019. Report on the proposal for a regulation of the European Parliament and of the Council establishing rules on support for strategic plans to be drawn up by Member States under the Common agricultural policy (CAP Strategic Plans). Available at https://www.europarl.europa.eu/doceo/document/A-8-2019-0200_EN.html?redirect
- Council of the European Union, 2019. Working paper on the proposal for a regulation of the European Parliament and of the Council establishing rules for the support for strategic plans to be drawn up by member states under the Common Agricultural Policy (CAP strategic plans) and financed by the EAGF and by EAFRD. Available at <http://www.arc2020.eu/wp-content/uploads/2019/09/Council-Position-5th-September-ARC2020-leak.pdf>.
- Díaz, S., Settele, J., Brondízio, E., Ngo, H., Guèze, M., Agard, J., Arneeth, A., Balvanera, P., Brauman, K., Butchart, S., 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Available at https://www.ipbes.net/sites/default/files/downloads/spm_unedited_advance_for_posting_htn.pdf
- EIP-AGRI Focus Group, 2016. Sustainable High Nature Value (HNV) farming (Final Report).

- Erjavec, K., Erjavec, E., 2015. 'Greening the CAP'—Just a fashionable justification? A discourse analysis of the 2014–2020 CAP reform documents. *Food Policy*, **51**, 53-62.
- European Commission, 2018. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing rules on support for strategic plans to be drawn up by Member States under the Common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulation (EU) No 1305/2013 of the European Parliament and of the Council and Regulation (EU) No 1307/2013 of the European Parliament and of the Council. Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A393%3AFIN>
- European Commission, 2019. Evaluation of the CAP on climate change and greenhouse gas emissions, available at https://ec.europa.eu/agriculture/content/evaluation-cap-climate-change-and-greenhouse-gas-emissions_en
- European Union, 2016. Consolidated treaties, Charter of Fundamental Rights 2016, available at https://op.europa.eu/en/publication-detail/-/publication/1194001c-c811-11e6-a6db-01aa75ed71a1/language-en?WT.mc_id=Selectedpublications&WT.ria_c=677&WT.ria_f=624&WT.ria_ev=search.
- Hagedorn, G., Kalmus, P., Mann, M., Vicca, S., Van den Berge, J., van Ypersele, J.-P., Bourg, D., Rotmans, J., Kaaronen, R., Rahmstorf, S., 2019. Concerns of young protesters are justified. *Science*, **364**, 139-140. DOI: [10.1126/science.aax3807](https://doi.org/10.1126/science.aax3807)
- Herzon, I., Birge, T., Allen, B., Povellato, A., Vanni, F., Hart, K., Radley, G., Tucker, G., Keenleyside, C., Oppermann, R., Underwood, E., Poux, X., Beaufoy, G., Pražan, J., 2018. Time to look for evidence: results-based approach to biodiversity conservation on farmland in Europe. *Land Use Policy*, **71**, 347–354. DOI: [10.1016/j.landusepol.2017.12.011](https://doi.org/10.1016/j.landusepol.2017.12.011)
- Hodge, I., Hauck, J., Bonn, A., 2015. The alignment of agricultural and nature conservation policies in the European Union. *Conservation Biology*, **29**, 996-1005. DOI: [10.1111/cobi.12531](https://doi.org/10.1111/cobi.12531)
- IPBES, 2018. *The IPBES assessment report on land degradation and restoration*. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany.
- IPCC, 2019. Climate Change and Land: An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems - Summary for Policy Makers.
- Jones, J. I., Murphy, J. F., Anthony, S. G., Arnold, A., Blackburn, J. H., Duerdoth, C. P., Hawczak, A., Hughes, G. O., Pretty, J. L., Scarlett, P. M., 2017. Do agri-environment schemes result in improved water quality? *Journal of Applied Ecology*, **54**, 537-546. DOI: [10.1111/1365-2664.12780](https://doi.org/10.1111/1365-2664.12780)
- Keenleyside, C., Beaufoy, G., Tucker, G., Jones, G., 2014. High Nature Value farming throughout EU-27 and its financial support under the CAP. Available at http://minisites.jeep.eu/assets/1386/HNV_and_CAP_Full_Report.pdf
- Lakner, S., Holst, C., Dittrich, A., Hoyer, C., Pe'er, G., 2018. Impacts of the EU's Common Agricultural Policy (CAP) on Biodiversity and Ecosystem Services, in S. Klotz, A. Bonn, R. Seppelt, M. Schröter and C. Baessler eds., *Atlas of Ecosystem Services – Risks and Opportunities*. Springer.
- Matthews, A., 2018a. The CAP in the 2021-2027 MFF Negotiations. *Intereconomics*, **53**, 306–311. DOI: [10.1007/s10272-018-0773-0](https://doi.org/10.1007/s10272-018-0773-0)

- Matthews, A., 2018b. The EU's Common Agricultural Policy Post 2020: Directions of Change and Potential Trade and Market Effects. Available at https://www.ictsd.org/sites/default/files/research/ictsd_-_the_potential_trade_and_market_effects_of_the_eu_cap_post_2020_-_alan_matthews_0.pdf
- Moreira, F., Pe'er, G., 2018. Agricultural policy can reduce wildfires. *Science*, **359**, 1001-1001. DOI: DOI: 10.1126/science.aat1359
- Müller, B., Johnson, L., Kreuer, D., 2017. Maladaptive outcomes of climate insurance in agriculture. *Global Environmental Change*, **46**, 23-33. DOI: [10.1016/j.gloenvcha.2017.06.010](https://doi.org/10.1016/j.gloenvcha.2017.06.010)
- Neumann, H., Dierking, U., Taube, F., 2017. Erprobung und Evaluierung eines neuen Verfahrens für die Bewertung und finanzielle Honorierung der Biodiversitäts-, Klima- und Wasserschutzleistungen landwirtschaftlicher Betriebe („Gemeinwohlprämie“), *Berichte über Landwirtschaft*. **95**. DOI: 10.12767/buel.v95i3.174
- Oppermann, R., Beaufoy, G., Jones, G., 2012. *High nature value farming in Europe. 35 European countries – experiences and perspectives*. Verlag regionalkultur Ubstadt-Weiher, Germany.
- Orgiazzi, A., Bardgett, R. D., Barrios, E., 2016. *Global soil biodiversity atlas*. European Commission.
- Pe'er, G., Dicks, L. V., Visconti, P., Arlettaz, R., Báldi, A., Benton, T. G., Collins, S., Dieterich, M., Gregory, R. D., Hartig, F., Henle, K., Hobson, P. R., Kleijn, D., Neumann, R. K., Robijns, T., Schmidt, J. A., Schwartz, A., Sutherland, W. J., Turbé, A., Wulf, F., Scott, A. V., 2014. EU agricultural reform fails on biodiversity, *Science*, **344**, 1090-1092. DOI: [10.1126/science.1253425](https://doi.org/10.1126/science.1253425)
- Pe'er, G., Zingrebe, Y., Moreira, F., Sirami, C., Schindler, S., Müller, R., Bontzorlos, V., Clough, D., Bezák, P., Bonn, A., Hansjürgens, B., Lomba, A., Möckel, S., Passoni, G., Schleyer, C., Schmidt, J., Lakner, S., 2019. A greener path for the EU Common Agricultural Policy, *Science*, **365**, 449-451. DOI: [10.1126/science.aax3146](https://doi.org/10.1126/science.aax3146)
- Pe'er, G., Lakner, S., Müller, R., Passoni, G., Bontzorlos, V., Clough, D., Moreira, F., Azam, C., Berger, J., Bezak, P., Bonn, A., Hansjürgens, B., Hartmann, L., Kleemann, J., Lomba, A., Sahrbacher, A., Schindler, S., Schleyer, C., Schmidt, J., Schüler, S., Sirami, C., Meyer-Höfer, M. v., Zingrebe, Y., 2017. Is the CAP Fit for purpose? An evidence-based fitness-check assessment, available at https://www.idiv.de/fileadmin/content/iDiv_Files/Documents/peer_et_al_2017_cap_fitness_check_final_20-11.pdf.
- Rutz, C., Dwyer, J., Schramek, J., 2014. More new wine in the same old bottles? The evolving nature of the CAP reform debate in Europe, and prospects for the future, *Sociologia Ruralis*, **54**, 266-284. DOI: <http://dx.doi.org/10.1111/soru.12033>
- Schulmeister, A., 2015. Eating up Forests: How EU Consumption Drives Deforestation and Land Conversion: The Case of Soy from Brazil., available at https://d20uvy59p0dg6k.cloudfront.net/downloads/wwf_epo_eu_soy_report_2015_v4_web_1.pdf.
- von der Leyen, U., 2019. A Union that strives for more - My agenda for Europe (Political guidelines for the next European Commission 2019-2024), available at https://ec.europa.eu/commission/sites/beta-political/files/political-guidelines-next-commission_en.pdf.
- WBAE, 2019. Zur effektiven Gestaltung der Agrarumwelt- und Klimaschutzpolitik im Rahmen der Gemeinsamen Agrarpolitik der EU nach 2020, available at

https://www.bmel.de/SharedDocs/Downloads/Ministerium/Beiraete/Agrarpolitik/Stellungnahme-GAP-Effektivierung-AUK.pdf?__blob=publicationFile

- Westerink, J., Jongeneel, R., Polman, N., Prager, K., Franks, J., Dupraz, P., Mettepenningen, E., 2017. Collaborative governance arrangements to deliver spatially coordinated agri-environmental management. *Land Use Policy*, **69**, 176-192. DOI: doi.org/10.1016/j.landusepol.2017.09.002
- Yang, H., Lupi, F., Zhang, J., Chen, X., Liu, J., 2018. Feedback of telecoupling: the case of a payments for ecosystem services program, *Ecology and Society*, **23**, 45. DOI: doi.org/10.5751/ES-10140-230245

Draft manuscript