

POLICY BRIEF

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# The EU Communication on ensuring availability and affordability of fertilisers—a milestone for sustainable nutrient management or a missed opportunity?

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## Abstract

The global mineral fertiliser crisis increased the pressure on the EU agricultural sector. In response, the EU Commission released a Communication on ensuring availability and affordability of fertilisers in November 2022. This Policy Brief discusses the Fertiliser Communication and critically questions whether (1) the proposed measures can contribute to combat the fertiliser crisis, and (2) whether they can make the EU agricultural sector more resilient and sustainable to comply with the Paris Agreement and the Aichi Targets to the Convention on Biological Diversity. Results show that the Fertiliser Communication falls short on both challenges. It relies on existing, insufficient policies and public support measures and fails to propose innovative and effective solutions. Moreover, existing fertiliser and fossil fuel import dependencies are maintained and shifted. To overcome these shortcomings and to comply with legally binding climate and biodiversity goals, a comprehensive governance approach for nutrient management and sustainable agriculture by economic instruments that apply to livestock husbandry and fossil fuels is introduced.

## Key points

- The Fertiliser Communication aims at ensuring availability and affordability of fertilisers for the internal market and globally.
- The proposals for domestic and international actions for a functioning fertiliser market are insufficient.
- The Fertiliser Communication fails to propose effective measures for making the EU agricultural sector more resilient and sustainable.

**Keywords** Fertiliser crisis, Nutrient management, Phosphorus, Nitrogen, Sustainable agriculture, Governance, EU Fertiliser Communication

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## Introduction

The current global mineral fertiliser crisis results from disrupted supply chains due to the COVID-19 pandemic, rising energy costs and the Russian invasion of Ukraine. In response, the European Commission released a Fertiliser Communication on ensuring availability and affordability of fertilisers on 9th November 2022 [1].



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The Fertiliser Communication aims at safeguarding food security and increasing the resilience of the agricultural sector. In the Fertiliser Communication, the Commission firstly provides an overview of the current challenges and causes of rising fertiliser, food and energy prices. Then, the Commission proposes short-term domestic measures and international actions to ensure fertiliser availability and affordability. Furthermore, long-term objectives of the EU are defined and placed in the context of existing strategies and policies.

According to the Fertiliser Communication, the EU's strategic goal is to reduce the dependency from Russian fertiliser and natural gas imports. With regard to fertiliser use in the EU, the Commission underlines the objectives of the Farm to Fork Strategy [2]. The Strategy aims at sustainable and resilient food value chains including reduced fertiliser use and minimized nutrient losses. The Fertiliser Communication furthermore highlights that the current fertiliser crisis is 'an opportunity to accelerate the transition to a sustainable agriculture [...] system' [1]. In general, a comprehensive governance approach for agriculture and nutrient management that targets the main drivers of ecological change, i.e., fossil fuels and animal husbandry, would help to combat the fertiliser crises and to comply with international legally binding environmental goals. Against this backdrop, this Policy Brief assesses the extent to which the proposed measures of the Fertiliser Communication are suitable to contribute to sustainable nutrient management and support a sustainability transformation of the agricultural sector to align it with the legally-binding objective of the Paris Agreement and the Kunming-Montreal Global Biodiversity Framework to the Convention on Biological Diversity. The Paris Agreement aims to limit global warming to well below 2° C, or even better 1.5° C [3] while the Kunming-Montreal Global Biodiversity Framework aims at halting biodiversity loss [4, 5].

### **Problem statement**

Food production in the EU is currently severely challenged due to fertiliser shortages, which result from direct and indirect import dependencies of fertilisers and intermediate products [1]. These shortages affect the essential nutrients potassium, phosphorus and nitrogen. Although some farms, such as farms in the organic sector, are less dependent on mineral fertilisers [6], the farming sector overall has been affected substantially. The EU is directly dependent on imports of potash and phosphate. Major exporting countries of potash are Canada, Belarus, and Russia. Phosphate rock is located in only a few regions of the world including Morocco/Western Sahara and Russia [7]. The price for phosphate rock has increased from 76 \$/mt in 2020 to 266 \$/mt in

2022 (annual average) [8]. Indirect import dependency concerns nitrogen fertilisers. The highly energy-intensive production process of ammonia for nitrogen fertilisers is to a large extent based on natural gas imports from Russia. In Summer 2022, price explosions for natural gas resulted in the shutdown of 70% of the ammonia production due to unprofitability [1]. Overall, high fertiliser prices and other input factor prices affect farmers' purchasing and planting decisions and might impact the next season's harvest.

### **Key proposals for domestic actions**

To combat the fertiliser crisis, the Fertiliser Communication proposes a set of domestic actions. First, in line with the Commissions' Communication 'Save gas for a safe winter' [9], Member States are encouraged to prioritise access to natural gas for fertiliser producers in their national emergency plans in the event of gas rationing [1, 9]. Second, the Commission proposes to expand the financial support to farmers and in particular to fertiliser producers through the Temporary Crisis Framework for State Aid, the agricultural reserve and solidarity levies. Third, the Commission aims at enhancing transparency of the EU fertiliser market by launching a new market observatory in 2023. Fourth, the Commission proposes several actions on fertilisers including enhanced access for organic and recycled fertilisers, support for the nitrogen fertiliser industry to produce ammonia with renewable hydrogen, greater import diversification, and launch of a new European Innovation Council on resilient agriculture in 2023. Lastly, the Commission encourages Member States to revise their Strategic Plans of the EU Common Agricultural Policy (CAP) to accelerate sustainable fertiliser use. The Commission expects Member States to include into their CAP Strategic Plans key elements of nutrient management such as the wider adoption of nutrient management plans, the implementation of a so-called Farm Sustainability Tool for Nutrients, the replacement of mineral fertilisers by organic fertilisers and the promotion of precision farming. The Commission also emphasises the beneficial effects of eco-schemes and agri-environment-climate commitments as well as Conditionality [1]. Furthermore, the importance of enhanced crop rotation with the inclusion of protein crops, crop diversification and catch crops are highlighted. Indeed, these management strategies are useful not only for sustainable nutrient management but also soil protection, climate and biodiversity conservation [10]. However, only crop rotation is a mandatory obligation of the CAPs' Conditionality and the EU decided to allow Member States to derogate from its adoption in 2023 to address the current crisis [11, 12]—an aspect that is not mentioned in the Fertiliser Communication and

directly contradicts the Communications' goals. Besides, during the CAP reform negotiations, the Farm Sustainability Tool for Nutrients was removed from the mandatory obligations of Conditionality and instead adopted as voluntary farm advisory service [12, 13]. Likewise, eco-schemes and agri-environment-climate commitments are voluntary measures. Overall, these measures will have little or no impact on the harvest in 2023 as the CAP only enters into force in 2023.

Apart from these shortcomings, other proposals of the Commission remain vague and non-committal. For example, the Commission 'points out that Member States may prioritise' fertiliser producers to access natural gas, 'takes steps' to improve market transparency, or 'will welcome and support' amendments of the CAP Strategic Plans [1]. Besides, action implementation is largely left to the Member States; thus, their effects are hard to predict.

### Key proposals for international actions

The measures to alleviate the fertiliser crisis at the international level are even vaguer than the proposals for domestic actions. The Commission proposes to extend the collaboration with third countries and international institutions to support sustainable fertilisation and to increase the transparency of global fertiliser markets [1]. It remains unclear who should collaborate, e.g., farmers, traders or politicians. Besides, 'discussions' in international fora shall cover various aspects of fertiliser supply and food security including the avoidance of export restrictions on fertiliser trade in the World Trade Organisation [1, for policies along the supply chain see 14]. Discussing these issues at the regional and international level is important, as are efforts to enhance the application of sustainable fertilisation practices and increased transparency, monitoring and diversification of the global fertiliser market. However, discussions are unable to support farmers in the short-term. Simultaneously, long-term effects appear unlikely as these discussions will probably not transpose into concrete policy instruments as seen e.g., in the annual Conference of the Parties to the United Nations Framework Convention on Climate Change.

### The EU's long-term objectives

Supplementing the proposals for short-term measures, the Fertiliser Communication establishes long-term objectives and flanking actions which indeed point towards a more resilient agricultural sector. The Commission aims at more sustainable fertiliser use, (well-researched) nutrient recycling from waste streams and green ammonia production for nitrogen fertilisers [1]. To upscale the green ammonia production based on renewable hydrogen, the Commission focusses on state aid and a new European Hydrogen Bank to invest in the

EU hydrogen market. To achieve nutrient recycling, the Commission proposes to use funds from Horizon Europe and the Emissions Trading System Innovation Fund for innovative demonstration projects on nutrient recycling [1]. The Commission also mentions the work on delegated acts to amend the annexes of the Fertilising Products Regulation [14] to enable the marketing of recycling fertilisers on the EU market [1]. Yet, such amendments to the Fertilising Products Regulation would be made even without the Fertiliser Communication. However, important amendments have still not been adopted [15].

### Critical review and proposals to make fertiliser use more sustainable

The overall output of the Fertiliser Communication is the presentation of merely two new initiatives: the market observatory and the European Innovation Council challenge on resilient agriculture. Aside from that, the Commission only calls on Member States to support fertiliser producers and refers to existing public support measures. Yet, these measures lack environmental requirements such as climate friendly production processes and fail to direct the agricultural sector towards sustainability. They will also most likely be ineffective to address the current fertiliser crisis. Instead, by proposing financial support for fertiliser availability and aiming at supply diversification of (mineral and synthetic) fertilisers and intermediate products, the Commission underpins the long-term import dependency on fertilisers and fossil fuels. Although the diversification of the fertiliser market is necessary and overdue, a greater focus on the strategic objectives would be more effective to avoid shifting from one import dependency into another.

Moreover, the Fertiliser Communication builds on weak existing policies. For example, the recent reform of the EU Fertilising Products Regulation illustrates that, for years, the EU missed the opportunity to transition the agricultural sector towards sustainability and resilience through effective policy reforms. Even though the EU Fertilising Products Regulation for the first time provides for market access for recycled fertilisers, it failed to implement strict threshold values for Cadmium in phosphate fertilisers (foreseen in the Commission's proposal). Strict threshold values for Cadmium could have put phosphate recyclates into an advantageous competitive position over mineral fertilisers [14, 16, 17]. Likewise, the recent reform of the CAP failed to implement comprehensive policy changes to enhance the sustainability of nutrient management and the whole agricultural sector [18, 19]. Nevertheless, the Fertiliser Communication relies on both, the Fertilising Products Regulation and the CAP measures.

To successfully address the current fertiliser crisis and simultaneously tackle climate change, biodiversity loss, pollutant load, water degradation and soil erosion, supporting fertilisers produced with renewable energy, large-scale production of fertilisers from secondary raw materials, and innovative fertilisation techniques are necessary in the short-term. In particular, to fight climate change, energy-intensive, fossil-based nitrogen fertilisers have to be phased out entirely in the long term [20, 21]. At the same time, fertilisers containing rock phosphate have to be replaced by organic and recycled fertilisers because of the EU's import dependency from a few, often politically unstable regions. Additionally, fertilisers containing rock phosphate are frequently contaminated with heavy metals, while mining, transportation and processing requires fossil fuels [7, 22, 23]. Overall, a sustainable and resilient agricultural sector has to be largely independent from synthetic and mineral fertilisers. At the same time, efficient fertilisation is necessary and nutrient losses, which result in water eutrophication and air pollution as well harmful consequences for biodiversity, climate and human health have to be minimised [22–24].

To substitute mineral fertilisers, the Fertiliser Communication emphasizes organic wastes and in particular (processed) livestock manure but fails to address the resource intensity of the livestock sector. The production of animal-derived food requires substantially more resources than the production of plant-based food due to large animal feed demand. Moreover, intensive livestock farming is the main driver of nutrient hotspots and thus of water eutrophication [22, 23]. Therefore, reducing resource use including fertiliser use and environmental damage demands limiting the consumption of animal-derived products [25, 26]. To this end, an EU cap-and-trade scheme for livestock products with a cap aligned to the objective of the Paris Agreement promises to be effective. In limiting animal numbers, the cap-and-trade scheme also reduces fertiliser demand and benefits climate, biodiversity, water bodies and soils. A complementary livestock-to-land ratio addresses nutrient hotspots caused by manure and thereby minimises nutrient discharges into water bodies [20, 26]. These policy instruments also reintegrate crop and animal farming, and contribute to close nutrient cycles and thus to a more sustainable nutrient management. However, reduced animal numbers will also limit manure which can replace mineral and synthetic fertilisers. While less livestock production implies an overall reduced nutrient demand, the limited availability of manure will likely promote the demand for mineral and synthetic fertilisers (see below for a governance proposal to avoid this shifting effect), but also the demand for other organic fertilisers such as compost and green manure and recycled fertilisers from

secondary raw materials. Besides, sustainable soil management practices including crop rotation, catch crops and mixed cropping including legumes have to become an integral element of nutrient management [20, 23, 27, 28]. In doing so, the EU can enhance its protein autonomy as aimed at in the Farm to Fork Strategy.

Supplementing the cap-and-trade scheme for animal products and the livestock-to-land ratio, an emissions-trading scheme to phase out fossil fuels in one or two decades appears very effective to comply with the 1.5 °C objective of the Paris Agreement. Phasing out fossil fuels would require synthetic nitrogen fertiliser production to shift from fossil fuels to renewable hydrogen. Besides, rock phosphate mining and processing would be hampered while organic fertilisers and recycled fertilisers produced with renewable energy supported [20]. The resulting higher fertiliser prices would incentivise fertilising efficiency—but not abruptly as due to a crisis, but politically announced and plannable in time. Only few complementary regulations are needed to e.g., ensure fertiliser quality through threshold values for contaminants and support research and innovation for recycling fertilisers and sustainable agricultural practices. Overall, these governance proposals show that identifying integrated solutions for intertwined environmental issues especially in the agricultural sector is a highly useful approach. Although the Fertiliser Communication acknowledges the need to not only solve the fertiliser crisis, but also other environmental challenges, the Commission neither seizes the opportunity to comprehensively transform the agricultural sector towards resilience and sustainability nor presents a milestone for sustainable nutrient management.

#### Abbreviations

CAP	Common Agricultural Policy
EU	European Union

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#### Author contributions

All authors contributed to the manuscript. Article conceptualisation, analysis and writing was mainly performed by BG. KH gave comprehensive feedback in terms of content, language and text structure. FE commented on the text and suggested some changes. All authors read and approved the final manuscript.

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## References

- European Commission (2022) Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Ensuring availability and affordability of fertilisers (COM(2022) 590 final). European Commission, Brussels
- 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: A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system (COM(2020) 381 final). European Commission, Brussels
- United Nations (2015) Adoption of the Paris Agreement (FCCC/CP/2015/L.9/Rev.1)
- United Nations (1993) Convention on Biological Diversity (Treaty Series, vol. 1760, p. 79, C.N.29.1996)
- Ekaradt F, Günther P, Hagemann K et al (2023) Legally binding and ambitious biodiversity protection under the CBD, the global biodiversity framework, and human rights law. *Environ Sci Eur* 35:80. <https://doi.org/10.1186/s12302-023-00786-5>
- Stubenrauch J, Ekaradt F, Heyl K et al (2021) How to legally overcome the distinction between organic and conventional farming—Governance approaches for sustainable farming on 100% of the land. *Sustain Prod Cons* 28:716–725. <https://doi.org/10.1016/j.spc.2021.06.006>
- United States Geological Survey (USGS) (2022) Mineral Commodity Summaries. USGS, Reston.
- The World Bank (2023) World Bank commodities price data (the pink sheet) (november 2023). The World Bank, Geneva
- European Commission (2022) Save gas for a safe winter (COM(2022) 360 final). European Commission, Brussels
- Blume H-P, Brümmer GW, Fleige H et al (2016) Scheffer/Schachtschabel soil science. Springer, Berlin and Heidelberg
- European Commission (2022) Commission Implementing Regulation (EU) 2022/1317 of 27 July 2022 providing for derogations from Regulation (EU) 2021/2115 of the European Parliament and of the Council as regards the application of the standards for good agricultural and environmental conditions of land (GAEC standards) 7 and 8 for claim year 2023 OJ L 199/1 from 28.7.2022
- European Union (2021) Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 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 Regulations (EU) No 1305/2013 and (EU) No 1307/2013 OJ L 435/1 from 6.12.2021
- European Commission (2018) Annexes 1 to 12. Annexes to 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) 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 (COM(2018) 392 final). European Commission, Brussels
- European Union (2019) Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003 OJ L 170/1
- Heyl K, Garske B, Ekaradt F (2023) Using bone char as phosphate recycling fertiliser: an analysis of the new EU Fertilising Products Regulation. *Environ Sci Eur* 35, 109. <https://doi.org/10.1186/s12302-023-00819-z>
- European Commission (2016) Proposal for a regulation of the European parliament and of the council laying down rules on the making available on the market of CE marked fertilising products and amending regulations (EC) no 1069/2009 and (EC) no 1107/2009 (COM(2016) 157 final). European Commission, Brussels
- Ulrich AE (2019) Cadmium governance in Europe's phosphate fertilizers: not so fast? *Sci Total Environ* 650:541–545. <https://doi.org/10.1016/j.scitotenv.2018.09.014>
- Pe'er G, Finn JA, Díaz M et al (2022) How can the European common agricultural policy help halt biodiversity loss? Recommendations by over 300 experts. *Conserv Lett* 15:e12901. <https://doi.org/10.1111/conl.12901>
- Heyl K, Döring T, Garske B et al (2020) The common agricultural policy beyond 2020: a critical review in light of global environmental goals. *RECIEL* 30(1):95–106. <https://doi.org/10.1111/reel.12351>
- Garske B, Ekaradt F (2021) Economic policy instruments for sustainable phosphorus management: taking into account climate and biodiversity targets. *Environ Sci Eur* 33:1–20. <https://doi.org/10.1186/s12302-021-00499-7>
- Heyl K, Ekaradt F, Roos P, Garske B (2023) Achieving the nutrient reduction objective of the farm to fork strategy. An assessment of CAP subsidies for precision fertilization and sustainable agricultural practices in Germany. *Front Sustain Food Syst* 7:1088640. <https://doi.org/10.3389/fsufs.2023.1088640>
- Panagos P, Köningner J, Ballabio C et al (2022) Improving the phosphorus budget of European agricultural soils. *Sci Total Environ* 853:158706. <https://doi.org/10.1016/j.scitotenv.2022.158706>
- Jupp AR, Beijer S, Narain GC et al (2021) Phosphorus recovery and recycling—closing the loop. *Chem Soc Rev* 50:87–101. <https://doi.org/10.1039/D0CS01150A>
- Beaulieu JJ, DelSontro T, Downing JA (2019) Eutrophication will increase methane emissions from lakes and impoundments during the 21st century. *Nat Comm* 10:1375. <https://doi.org/10.1038/s41467-019-09100-5>
- Nedelciu CE, Ragnarsdottir KV, Schlyter P, Stjernquist I (2020) Global phosphorus supply chain dynamics: assessing regional impact to 2050. *Glob Food Sec* 26:100426. <https://doi.org/10.1016/j.gfs.2020.100426>
- Weishaupt A, Ekaradt F, Garske B et al (2020) Land use, livestock, quantity governance, and economic instruments—sustainability beyond big livestock herds and fossil fuels. *Sustainability* 12:2053. <https://doi.org/10.3390/su12052053>
- Selzer T, Schubert S (2021) Nutrient uptake of catch crops under non-limiting growth conditions. *JPNSS* 184:709–722. <https://doi.org/10.1002/jpln.202100142>
- Powers SM, Chowdhury RB, MacDonald GK et al (2019) Global opportunities to increase agricultural independence through phosphorus recycling. *Earth's Future* 7:370–383. <https://doi.org/10.1029/2018EF001097>

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