

Fertilisers: on the verge of a major food crisis?

Making agriculture so dependent on fossil fuels was a dangerous mirage rather than a revolution.

Antonio Turiel and Juan Bordera

With the price of the benchmark oil barrel (Brent) exceeding 90 dollars for the first time in eight years -coinciding with the announced end of the fracking boom/bubble-;¹ the recent historic escalation in gas prices -which has quadrupled in price during 2021- and, consequently, in the electricity bill; or with the highest inflation in Spain in three decades -6.5% in 2021- anyone might think that the biggest problem we have is the energy problem. And they would probably be right, although the seriousness and depth of the climate problem, which in the long term is at least as serious, cannot be ignored. However, this crossroads is a ramification between scarce energy and an unstable climate whose severity is often not understood: we eat fossil fuels.²



Photo by [Etienne Girardet](#) on [Unsplash](#)

And not just because they are needed to transport or refrigerate both the food itself and the materials required in the strained supply chain, but because, directly, some of the fossil fuels we extract are also used in the production of

¹ ↪ Collin Eaton: [Oil Frackers Brace for End of the U.S. Shale Boom – Limited inventory leaves the industry with little choice but to hold back growth, even amid high oil prices](#) - The Wall Street Journal, 3 February 2022.

² ↪ Melissa C. Lott: [10 Calories in, 1 Calorie Out - The Energy We Spend on Food](#) - Scientific American, 11 August 2022

pesticides and, above all, fertilisers for "modern agriculture". About one-third of all energy used in the agricultural sector is used for manufacturing inorganic fertilisers.

Let's analyse the consequences of rising fertiliser prices. We discover that they are already causing severe problems in many countries. The high cost of soya has led Argentina to limit beef exports until 2023.³ Brazil has been experiencing a severe food crisis since 2018. The UN has just included Colombia among the "hunger hotspots",⁴ and not so far away, they are on the verge of a farmers' revolt in Greece.⁵ If we analyse the price escalation, we will discover a complex tangle that we had better untangle and understand well to clarify what should be done.

Making agriculture dependent on fossil fuels was a dangerous mirage rather than a revolution.

The number of factors involved is enormous: geopolitical, environmental, the recovery of demand, the pandemic... but above all, energy stands out very clearly. And the relationship is direct: if the price of energy rises, so does the cost of fertilisers, transport and almost all production processes. Ergo, the escalation of food prices is inevitable, which is why the FAO anticipates a global food crisis worse than that of 2011 this year. All this without considering the speculation of the financial markets, always as clever and reasonable in allocating resources as they have been to date.

Some of us had already warned our readers in texts such as *The Autumn of Civilisation*. There we said, months ago: "We will have to keep a close eye on this: after that "green revolution" in agriculture, which was rather black, a crude colour, the food chain is absolutely oil-dependent".⁶ And so, rising energy prices and the growing scarcity of resources are bringing us closer to the edge of a dangerous precipice: that of a major food crisis. We are certainly on the verge of such a situation. Making agriculture dependent on fossil fuels was a dangerous mirage rather than a revolution.

The production of nitrogen fertilisers - ammonium, urea - depends mainly on natural gas, so their prices have risen sharply. The cost of potash has also soared - the second and third largest producers are Belarus and Russia, respectively, and Belarus, in particular, is suffering from sanctions that aggravate the situation of escalating prices - mainly due to the general increase in extraction costs of all mining materials. Finally, phosphates are becoming increasingly scarce. Of the three ingredients in the NPK formula, which is the basis of modern agriculture, it is most at risk of depletion in the short term. The rock extraction process is also energy-intensive. Consequently, prices are now approaching the levels of the last major crisis, more than a decade ago. We are already suffering the highest food prices since 2011. But the context is no longer the same as it was then. It is worse.

The problem is worse because we have less time to fix it. But above all, because it is structural. Yet, the corrective and anticipatory measures that are being taken address it as if it were something temporary, transient, that can be fixed by stopping now and waiting for the market to find more efficient solutions to produce these indispensable fertilisers practically out of thin air.

A clear example of the prevailing short-termism and lack of understanding of food supply can be found in the case of nitrogen fertilisers. During the worst time of the natural gas crisis in 2021, most European production plants for these

³ ↪ Patrick Gillespie: [Argentina Extends Export Ban on Popular Beef Cuts to Tame Local Prices](#) – BloombergQuint 3 January 2022.

⁴ ↪ Redacción Salud: [Colombia está entre los 20 países en riesgo de enfrentar hambre aguda en 2022: FAO](#) – El Espectador, 28 enero 2022.

⁵ ↪ EuroNews en Español: [El grito de socorro de los agricultores en Grecia por la subida de los precios de la energía](#), 28 enero 2022.

⁶ ↪ Antonio Turiel y Juan Borda: [El otoño de la civilización \(y la ruptura de la cadena de suministros\)](#) – CTXT, 17 septiembre 2021.

fertilisers stopped for a few weeks. Then they reopened, such as Fertiberia in Spain, only after signing contracts with their customers guaranteeing much higher purchase prices. Still, they are operating at half-gas (never better said). China

That one of the world's largest natural gas producers would shut down its fertiliser exports should be enough of a wake-up call to make our "political leaders" react.

reduced its exports of nitrogen fertilisers by 90% in September 2021, and they are there to stay. The need to feed 1,4 billion mouths and the increase in production costs due to the Chinese energy crisis -particularly coal- means that Chinese fertilisers, so crucial in Iberian America, will not leave the borders of the Middle Kingdom, no matter

how many emerging markets may arise. More worryingly, Russia imposed an embargo on fertiliser imports from 1 February 2022 until 31 March,⁷ which is possibly extendable. That one of the world's largest natural gas producers would shut down its fertiliser exports should be enough of a wake-up call to make our "political leaders" react, if you will pardon the irony.

The pressure to increase biofuel production, now that oil is beginning to flirt with the \$100 per barrel mark is another added risk of withholding more food at a time of scarcity and famine. Especially when more fertiliser-demanding crops, such as corn, are massively used for the production of bioethanol (40% of that produced in the United States comes from this source) and for fattening livestock. On some farms in Europe, farmers may be forced to slaughter part of their herds prematurely because they cannot afford to feed them.

Climatic and environmental factors will also play an important role. If there is a prolonged drought—there are already problems in Spain⁸ at the start of the driest year of the century—it could be even more devastating, as nitrogen, which will be more scarce for crops than in other years, is critical because it helps plants to withstand dry days. But the drought map in 2022 has become global. This is what happens when climate chaos knows no borders: the entire Southern Cone (Chile, Argentina, Brazil) is suffering one of the driest summers in history, combined with droughts in the USA, Russia, Ukraine... The world's granaries are drying up.

Let us also add that summer storms in the US temporarily shut down some plants, including the world's largest nitrogen complex. And let us assume - as it happens - that our fragility is proportional to the complexity of our system. We could also talk about the disastrous environmental consequences of the massive and uncontrolled use of fertilisers: eutrophication of waters—as in the tragedy of the Mar Menor—pollution of groundwater, loss of soil quality... a change in the agricultural model is unavoidable.

We have become utterly dependent on substances that have enormously increased agricultural yields, but which in turn degrade farmland and are based on a continuous and increasing injection of energy—increasingly scarce—which is literally thrown up and scattered over the ground. The "green revolution" led us to believe that we could leave the spectre of hunger behind forever, a dream from which we may awaken abruptly with real nightmares.

Our binge on fossil-age energy abundance has led us to alter the metabolism of the Earth system.

The growing energy crisis is spreading and branching out into all areas, and industrial agriculture was to be no exception. The supply crisis is the crisis of all supplies, including food. *The Fall of Civilisation* is coming, and we have not

⁷ ↪ Agrodigital.com: [Rusia prohíbe la exportación de nitrato de amonio durante dos meses](#), 3 febrero 2022.

⁸ ↪ RTVE: [La falta de lluvias pone contra las cuerdas a agricultores y ganaderos](#), 8 febrero 2022.

prepared a storehouse, or even a coherent response, to face the winter that lies ahead. Governments are reacting with excess and little planning in the face of unprecedentedly serious challenges.

Our binge on fossil-age energy abundance has led us to alter the metabolism of the Earth system. We changed the trophic balance of our planet; we took over the essential biogeochemical cycles (of nitrogen, phosphorus, water) so that the Earth could serve us, riding on immense mountains of energy. It didn't matter that we broke the balance. It didn't matter that we poisoned its metabolism. The metabolic rift made us swim in an unprecedented abundance,⁹ a very dangerous abundance.

In our folly, we failed to see that agriculture had become dependent on mining and other extractive activities. That is that

We turned something as intimate and sacred as farming into an activity of mining, extraction and destruction. An unsustainable madness carries a bill we will have to pay with it.

the world's food supply is itself dependent on a hyper-complex chain and the supply of other even more limited resources. And that it had therefore become totally vulnerable to scarcity and depletion. We turned something as intimate and sacred as farming into an activity of mining, extraction and destruction.

An unsustainable madness carries a bill we will have to pay with it; the rift of the metabolic rift. And it will get bigger as long as we let the problem rot in its inertia.

The shock against the biophysical limits of the planet is leading us fatally into further clashes with each other. When the pond dries up, the fish get nervous. Where are these conflicts happening now? In Ukraine, the breadbasket of Europe, a fertile land full of resources. Or in Belarus, the world's second-largest potash producer. That's where some sharks are instigating a war—perhaps playing with fire. Believing they can further inflate the price of gas to profit from exports while trying to turn the corpse of fracking into something apparently profitable again.

No to war, always. But today, more than ever, this can aggravate the whole food and energy crisis tremendously. When Lukashenko, the Belarusian president, brought down that plane in May 2021 to arrest the opposition Protasevich, no one could have foreseen that the sanctions imposed on Belarus would create such severe problems on a global scale. No potash, no food, the agricultural sector has told President Biden.¹⁰ Suddenly we realise that we are vulnerable. Very vulnerable.

Are we prepared for a new wave of revolt like the Arab Spring—spurred, let us remember, by food shortages—but on a global scale and unpredictable in scope? In this war against ourselves, will we be able to avoid wrecking the delicate supply chain that sustains the global food system? The most cynical will assume that it will be the poorest countries that, as always, will bear the brunt; but this time, there will be consequences for everyone. Because we all need to eat, and virtually no country has food sovereignty in a world immersed in decaying globalisation.

The metabolic rift that brought about fossil abundance is fracturing. In the Age of Limits, we have to rethink our relationship with the Earth and each other. We can try to maintain the current hypercompetitive system that has brought us to this situation and still collapse because of our stubbornness. Or we can begin to work for a change of model, in all orders of life, that will lead us to a balance, repair the rift, to weave a common path to adapt to what is to come.

⁹ ↪ Helios Escalante: [La agricultura mundial, en la cuerda floja de los fertilizantes químicos](#) — El Salto, 2 febrero 2022.

¹⁰ ↪ Cyril Widdershoven: [Why Belarus Is Becoming A Headache For Biden](#) — OilPrice.com, 2 February 2022.

Succinctly, it depends on us, on our capacity to organise ourselves and slow down the pace, to adapt it to the cycles and limits, now that we are already facing a precipice that is getting bigger as the problems pile up.

Related links:

- The Jus Semper Global Alliance
 - Álvaro J. de Regil: [The Deceptive Delusions of Green Capitalism](#)
 - Álvaro J. de Regil: [Transitioning to Geocratia the People and Planet and Not the Market Paradigm — First Steps](#)
 - Álvaro J. de Regil: [Marketocracy and the Capture of People and Planet](#)
 - The Editors of Monthly Review: [Leaked IPCC Reports](#)
 - John Bellamy Foster and Brett Clark: [The Expropriation of Nature](#)
 - Johan Rockström, Joyeeta Gupta, Timothy M. Lenton ET AL: [Identifying a Safe and Just Corridor for People and the Planet](#)
 - Paul Burkett: [An Eco-Revolutionary Tipping Point?](#)
 - Víctor M. Toledo: [What are we saying when we talk about sustainability?](#)
-

- ❖ **About Jus Semper:** The Jus Semper Global Alliance aims to contribute to achieving a sustainable ethos of social justice in the world, where all communities live in truly democratic environments that provide full enjoyment of human rights and sustainable living standards in accordance with human dignity. To accomplish this, it contributes to the liberalisation of the democratic institutions of society that have been captured by the owners of the market. With that purpose, it is devoted to research and analysis to provoke the awareness and critical thinking to generate ideas for a transformative vision to materialise the truly democratic and sustainable paradigm of People and Planet and NOT of the market.
- ❖ **About the author:** **Antonio Turiel** has a PhD in Physics Theory and a degree in Mathematics, he is also a Research Scientist at the CSIC Institute of Marine Sciences and author of the essay Petrocalipsis. **Juan Bordera** is a scriptwriter, journalist and activist at Extinction Rebellion and València en Transició.
- ❖ **About this Brief:** Fertilisers: on the verge of a major food crisis? was originally published in Spanish by CTXT in February 2022. This paper has been published under Creative Commons, CC-BY-NC 4.0. You are welcome to reproduce the material for non-commercial use, crediting the author and the original publisher.
- ❖ **Quote this paper as:** Antonio Turiel and Juan Bordera: Fertilisers: on the verge of a major food crisis? — The Jus Semper Global Alliance, March 2022.
- ❖ **Tags:** fertilisers, metabolic rift, capitalism, production, agriculture, fossil-energy, sustainability, earth system.
- ❖ The responsibility for opinions expressed in this work rests only with the author(s), and its publication does not necessarily constitute an endorsement by The Jus Semper Global Alliance.



Under Creative Commons Attribution 4.0 License
<https://creativecommons.org/licenses/by-nc/4.0/>

© 2022. The Jus Semper Global Alliance
Portal on the net: <https://www.jussemper.org/>
e-mail: informa@jussemper.org