The response of the global food system to the Covid-19 crisis has been in sharp contrast to the price spike and food panic of 2008. Exceptions prove the rule, but in general, helped by ample supplies, high stocks and modestly affected prices, constraints in trade flows have been limited.

Thus, the health crisis did not turn into a food crisis. The EU food system has a lot to be proud of in this context, as its response to the crisis (both public and private) is reflective of an increasing sophistication, innovative spirit and openness built over many years. When we recover from the crisis, whatever path the recovery takes, the experience gained, especially the boost in digital solutions, will be part of it.

However, on food, the Covid-19 crisis triggered a resurgence of the polarisation in the public debate around two global challenges – climate change and food security. The latter came back into the headlines after years of being dormant, while the former never left the headlines. Both are sometimes wrongly presented as opposing each other, despite being integrally linked in the need to address global problems.

This is already reflected in the wording of the 2016 Paris Agreement on Climate Change by:

- ‘Recognizing the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change’;
- Focusing on ‘Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production’;
- Recognising agriculture as not just part of the problem, but also as integral in the ‘Agenda for solutions’.

While the Paris Agreement put the accent on developing synergies, the general polarisation of attitudes around food security and climate change reflects two diametrically opposed views whose accents are on tensions. While the origin of both approaches is common – there is a genuine need to address these issues – they tend to focus first on either climate change or food security. This approach tends therefore to see trade-offs where there are synergies and imagines synergies where there are trade-offs.

On the one hand, the Covid-19 crisis is being used as evidence that ‘food systems are broken’ and policies around food are a ‘catastrophe’. This view sees climate change as the opportunity to change things in a direction driven by pre-fixed ideas regardless of their broader context. Yet we do not need to be organic to be sustainable, nor small to be environmentally friendly, and we can eat meat and still care about the planet. The demonstrated capacity of the alleged ‘broken’ food system in the real world to respond to the crisis makes a mockery of such an extreme position.

On the other hand, some also use the Covid-19 crisis as the pretext to turn food security into an anti-globalisation platform. Such solutions, in the specific context of addressing domestic demands via strengthening the domestic production potential, and encouraging innovative local networks,
are entirely legitimate. However, these are presented as the magic wand that would solve real and perceived problems of globalisation by ignoring that food security is a global challenge and that (nationalistic and trade protectionist) ‘food-sovereign’ solutions can only make matters worse.

If not all is broken, and not all is local, then what?

In polarising the debate, there is an increasing use of a cut-and-paste approach of expert opinion, often grouping together otherwise conflicting ideas repeating *ad nauseam* the same arguments even when the context that underlies them differs. This approach will not do. Giving the impression of a ‘silver bullet’, it fails to address the fundamental problem of polarisation between food security and climate change. To get both sides of the debate and the wider public on board, we need to rely on concrete examples that convincingly address how both challenges can be tackled synergistically at a global level. As both challenges are joint and global, so should be their solution.

Local markets and short food-chain circuits can reduce the local carbon footprint and add value to farm products, and we have plenty of examples demonstrating they have done so. ([https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-value-chains_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-value-chains_en.pdf)). However, the majority of the world’s population live in urban centres, and cannot be fed in sufficient quantities with small-scale solutions. Technological breakthroughs can increase large-scale productivity and thus improve food security, and we have concrete examples stemming from digitalisation and precision farming ([https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-digital-transformation_en.pdf](https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/farming/documents/factsheet-agri-digital-transformation_en.pdf)). Yet their benefits are not equally spread, generating fears of more national food dependence and thus resistance to global approaches. The FAO has estimated the expected need for more food at world level, in its *Towards Sustainability Scenario* (TSS), at 22 per cent by 2030 and 50 per cent by 2050 (the figures for Europe and Central Asia production are 33 and 57 per cent, respectively). The Business As Usual (BAU) Scenario results in roughly 10 per cent higher figures in every one of the above categories.

How to solve this conundrum? As a contribution, this article offers some facts from key statistics of the main players in global agricultural markets that could shed light on the potential trade-offs when addressing the need to produce more food, with smaller footprints -- and do it better.

Changes in world production patterns .... Data from FAO’s database (FAOSTAT) shed light in a comparable manner to developments in the big-5 agricultural producers (EU, US, China, India and Brazil), as well as Africa (taken as a region, due to many players) and the world,
Covid-19: The Impact on the Climate Change/Food Security Debate

...are reflecting changes in the level of emissions from agriculture .... Figure 2 depicts cumulative changes in total emissions from agriculture, as well as emissions of methane, from manure management and from synthetic fertilisers, expressed in CO₂ equivalent.

Die Gesundheitskrise hat sich nicht in eine Nahrungsmittelkrise verwandelt .... Der Nahrungsmittelsektor der EU hat in diesem Zusammenhang viel, worauf er in seiner Reaktion auf die Krise stolz sein kann.

The emerging economies will play central though diverging roles. © Pixabay

bearing in mind the caveats with respect to the quality and comparability of the data (Figure 1).

Different countries and regions in the world have adjusted in different ways to produce more in order to respond, in varying degrees, to a world population that increased from 5.3 to 7.6 billion between 1990 and 2017; and whose dietary patterns changed (Le et al., 2020) while technical change affected the intensity levels of their production patterns.

Central in these developments is the increasing, though diverging, role of the emerging economies of China, Brazil and India, lifting world production averages up in the process; and the slower growth of African agriculture, considering its population growth. Between 1990 and 2018, Africa’s population doubled to approach that of China and India, which grew at markedly lower rates. The population growth rate of China during this period is lower than that of the US, while the EU has the lowest population growth.

Agricultural area at the global level was marginally higher by 0.2 per cent during this period, leading to declines in per capita availability of land for food production. The biggest drop was where population grew more rapidly. Notable during this period is the significant decline in the EU cattle herd, and the very significant increase in Brazil and Africa.

Worth mentioning also (especially given the very one-sided debate on livestock developments) is the fact that India alone has 10 per cent more cattle than the combined herds of the EU, the US and China, while Brazil has 15 per cent more than the EU and US combined.

The level and pattern of emissions reflect changes not just in agricultural outputs, but also inputs, in terms of the level and intensity of fertiliser use, together with the cattle hectare density.

Combining changes in production, input use and the path of total emissions, the following summary conclusions can be drawn: the EU produced more with less, the US more with (more or less) the same, while production
increases in China, India, Brazil and Africa came with higher total emissions. When measured in emissions per capita or per area, the EU and US emit more but at very different per capita levels (especially the US). However, another important distinction is that the so-called ‘old world’, with its high population density, emits more per hectare of land than the less densely populated ‘new world’ (Figure 3).

Changes in total GHG emissions, as well as methane, manure management and synthetic fertiliser emissions, show the path of EU agriculture compared to the rest of the world. EU progress has stagnated in recent years as the momentum of previous CAP reforms slowed. More attention should be paid to the explanatory factors for this slowdown, to draw lessons for the future, both with respect to what worked well – and what did not.

... and highlight the complex relationship of food security to climate change. Changes in the grain surplus or deficit position of major agricultural players during the past three decades, at country or regional level, summarise major global patterns not just in terms of direct food grain consumption, but also through feed demand that indirectly reflect changes in the livestock sector. This pattern is indicative of how Europe in wheat and the Americas in maize cover the growing deficits of Africa and Asia. More details for other sectors are available elsewhere (Haniotis, 2020).

While the surplus/deficit situation in various countries and regions is directly linked to the food security debate, it is rarely addressed in parallel with the environmental footprint of the relative positions of the various players. Figures 4 and 5 attempt to do this by comparing the manner by which the relevant surplus/deficit evolved between 1990 and 2017 for cereals and meats, respectively. The vertical axis of these Figures reflects the net trade balance of each region, while the horizontal axis shows emissions (in GHG emissions equivalent) in these respective sectors.

Both Figures confirm the point made earlier about the manner by which different regions responded to the need to increase production. As Figure 4 demonstrates, the EU-28, and especially Russia and Ukraine,
increased their wheat surpluses while reducing emissions. The US, which has shifted away from wheat, reduced its surplus (with a minor increase in emissions), while Brazil and India addressed their food security concerns with a significant increase in emissions. China and Africa demonstrate a decline in performance both in terms of their food security concerns and in terms of their footprint. Figure 5 shows again the EU-28 as the only major player with a positive development on emissions and an improvement in its net trade position. The US, Brazil and India increased their surpluses, but at a significant cost with respect to emissions, while China and Africa lagged behind on both fronts. Enhancing synergies between climate action and food security requires an understanding of their potential trade-offs in three of the four food security pillars: availability, utilisation and stability (access to food of course is a different issue) Figures 4 and 5 are indicative of the rather complex challenges that lie ahead. Without altering in any way the need for more action on both, they nonetheless point to the need to address these policy priorities in a global perspective.

The importance of science
All major agricultural countries and regions have faced area constraints in meeting the growing demands from the 40 per cent increase in world population during the past 30 years. They thus relied on crop yield growth to increase production, with higher use of fertilisers, except in the EU. While livestock production almost doubled, the cattle herd was significantly reduced in the EU, and to a lesser extent in the US and China.

Among all major global actors, only EU agriculture has reduced its GHG emissions, including methane. Emissions were rather stable in the US, but increased in all other major countries. However, per capita and per area emissions differ significantly, with the ‘old world’ having a higher level of intensity in its agriculture than the ‘new world’.

Brazil, the US and the EU, in different sectors and to varying degrees, increased their food surpluses in volume terms, while Africa and Asia generally increased

The health crisis did not turn into a food crisis … the EU food system has a lot to be proud of in this context, as its response to the crisis.

Different countries and regions in the world have adjusted in different ways to produce more to respond to an increasing world population. © Pixabay

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their deficits, notably Africa in food grains and Asia in feed and in livestock products.

These facts clearly point to an uncomfortable reality – globally, we need to produce more with less; therefore, both economic and environmental efficiency matter. Maybe not all current production needs to be consumed everywhere; but as long as we agree that choices cannot be imposed, but nudged, then what will be produced better will be produced with the lowest joint environmental and economic cost.

Food should flow to where it is needed, and trade plays a crucial role in this. Yet trade is not perfect in terms of the distribution of benefits, and will never be so. However, the necessary mechanisms to mitigate negative impacts from globalisation are more effective when they address the domestic weaknesses; and gaps in knowledge, innovation, and distribution of benefits without introducing measures that hamper global solutions to global problems.

It is in this respect that Covid-19 acts as a reminder of the role of science, as hopes for the development of medicines and vaccines against it and against future pandemic risks are relying on advances in the frontier of science; on biotechnology, on artificial intelligence, on nanotechnology and so on. This is also the case with respect to so many human (and animal) diseases. Yet, this is in sharp contrast to the fact that the acceptance of science that is addressing plant diseases seems to have frozen in the EU (a useful reminder that 2020 is the Year of Plant Health).

It is thus imperative to recognise the importance of science, especially since its reliance on rigorous hypothesis testing and the consequent margin for error imply a greater need for building confidence in its applications. This crucially depends on learning the multiple lessons from Covid-19 and better communicating our capacity to address so many of the challenges facing the EU and across the world.

Disclaimer

The views expressed here are those of the author and do not necessarily reflect those of the European Commission.

Further Reading

- Haniotis, T. (2018) The CAP, Its Challenges and the European Green Deal. Presentation at the IFPRI Policy Seminar ‘European Green Deal -- Farm to Fork Strategy for Sustainable Food’ 18 February 2020, Washington, DC. Available online at: https://www.ifpri.org/sites/default/files/feb_18_tassos_haniotis_text_version_of_presentation.pdf
- Le, T.H., Disegna, M. and Lloyd, T. (2020). National food consumption patterns: Converging trends and the implications for health. EuroChoices. Available online at: https://doi.org/10.1111/1746-692X.12272
- Haniotis, T. (2020). Facts on Food Security and Climate Change. Available online at: https://www.slideshare.net/TassosHaniotis/200420-haniotis-foodsecurityandclimatechange; https://www.slideshare.net/TassosHaniotis/food-amp-agriculture-background-haniotislinkedin
- The most complete dataset on food security is www.fao.org/faostat/en/home, the statistical portal of the FAO, which also includes statistics on emissions. (The latter require significant corrections in the units used, which are not uniform across years). Data on emissions are available in the IPCC https://www.ipcc.ch/data/, but are found in a more reader friendly way at https://www.climatwatchdata.org/ (with alternative methodologies applied).
- For the world food security situation, FAO publications provide comprehensive coverage http://www.fao.org/publications/sofi/en/, http://www.fao.org/worldfoodsituation/en/. For the EU, the AGRI-food data portal provides information both on markets as well as on indicators: https://agridata.ec.europa.eu/extensions/DataPortal/home.html, while the short-term and long-term market developments are available at https://cc.europa.eu/info/food-farming-fisheries/farming/facts-and-figures/markets/outlook/.
- It is beyond the scope of this article to focus on the long list of literature that is critical of the CAP, and more negative on the performance of EU agriculture as presented here. The reader can get a flavour from Birdlife https://www.birdlife.org/europe-and-central-asia/common-agriculture-policy-reform or the IPES http://www.ipes-food.org/about/. Recent very critical papers also include the call of 3,600 Scientists for a CAP Overhaul https://besjournals.onlinelibrary.wiley.com/doi/10.1002/pans.10080, as well as the recently published Report of the Group of Chief Scientific Advisors, which is available at https://cc.europa.eu/info/files/summary-sustainable-food-system_en.
- The common thrust of this literature is the rejection of income support as an appropriate measure of agricultural policy, and the notion that public money should be targeted to public goods (after a transition). Common to these approaches is also the lack of a comprehensive analysis of the cumulative impact of suggested changes on food security concerns. For a more balanced critical stance on the CAP, with a wide and generally objective coverage of topics, visit the blog edited by Alan Matthews http://capreform.eu/ and the site of ARC2020 https://www.arc2020.eu/.
- On ‘food sovereignty’, there is a long list of literature, mostly a reflection of issues around the definition provided by Via Campesina, especially its links to the rights of native populations (https://viacampesina.org/en/food-sovereignty/). But the term has also assumed an EU farm policy angle to limit trade liberalisation and promote food autarcity (often confused – if this were to be achieved – at EU or national level). These positions are reflected at https://nyeleni.org/, while the latest position of researchers on this (in French) is as a reflection of the origin of such ideas, available at https://foodgovernance.files.wordpress.com/2020/06/20strategy-commentary-franc-3a7ais-1.pdf.

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Has Covid-19 Polarised the Debate on Climate Change and Food Security in the European Union?

The response of the global food system to the Covid-19 crisis demonstrated not just its capacity to prevent a health crisis turning into a food crisis, but also highlighted deep divisions around the manner in which food security and climate action interact. The global food system has genuine shortcomings which are part of a much broader, complex picture of trade-offs between enhancing climate action and food production; all major agricultural countries and regions face area constraints in meeting growing demands from the expected increase in world population. Amongst all major global players it is only in the EU that agriculture has reduced its GHG emissions, and even then momentum seems to have been exhausted recently. However, per capita and per area emissions differ significantly, with the ‘old world’ having a higher level of agricultural intensity than the ‘new world’. These production changes saw Brazil, the US and the EU, in different sectors and to varying degrees, increase the volume of food surpluses, while Africa and Asia generally increased their deficits; the former in food grains and the latter in feed and livestock products. These facts clearly point to an uncomfortable reality – that globally, we need to produce more with less, and therefore both economic and environmental efficiency matter.

La Covid-19 a-t’elle polarisé le débat sur le changement climatique et la sécurité alimentaire dans l’Union européenne ?

La réponse du système alimentaire mondial à la crise de la Covid-19 a démontré non seulement sa capacité à empêcher une crise sanitaire de se transformer en crise alimentaire, mais a également mis en évidence de profondes divisions sur la manière dont la sécurité alimentaire et l’action climatique interagissent. Le système alimentaire mondial présente des faiblesses réelles, qui font partie d’un tableau beaucoup plus large et complexe de compromis entre le renforcement de l’action climatique et la production alimentaire; tous les grands pays et régions agricoles sont confrontés à des contraintes de superficie pour répondre à la demande croissante liée à l’augmentation prévue de la population mondiale. Parmi tous les principaux acteurs mondiaux, seule l’Union européenne a réduit les émissions de gaz à effet de serre de son agriculture, même si l’élan semble s’être épuisé récemment. Cependant, les émissions par habitant et par zone diffèrent considérablement, le “vieux monde” ayant un niveau d’intensité agricole plus élevé que le “nouveau monde”. Parmi les changements de production observés, le volume des excédents alimentaires a augmenté, dans différents secteurs et à des degrés divers, au Brésil, aux États-Unis et dans l’Union européenne, tandis que l’Afrique et l’Asie ont généralement augmenté leurs déficits; le premier continent dans les céréales vivrières et le second dans les aliments du bétail et les produits animaux. Ces faits indiquent clairement une réalité inconfortable : à l’échelle mondiale, nous devons produire plus avec moins et, par conséquent, l’efficacité est importante à la fois au plan économique et environnemental.

Hat Covid-19 die Debatte über den Klimawandel und die Lebensmittelsicherheit in der Europäischen Union polariert?

Die Reaktion des globalen Nahrungsmittelsektors auf die Covid-19-Krise hat nicht nur gezeigt, dass dieser in der Lage war, zu verhindern, dass sich eine Gesundheitskrise in eine Nahrungsmittelkrise verwandelt. Sie hat darüber hinaus auch eine tiefe Spaltung in der Art und Weise deutlich gemacht, wie Nahrungsmittelsicherheit und Klimaschutz zusammenwirken. Der globale Nahrungsmittelsektor weist echte Mängel auf, die Teil eines umfassenderen, komplexen Zielkonflikts zwischen der Verbesserung des Klimaschutzes einerseits und der Nachfrage nach Nahrungsmitteln andererseits sind: Alle wichtigen Agrarländer und -regionen sehen sich bei der Deckung des wachsenden Bedarfs aufgrund des erwarteten Anstiegs der Weltbevölkerung mit einer begrenzten Verfügbarkeit von Land konfrontiert. Von allen großen globalen Akteuren hat nur die Landwirtschaft in der EU ihre Treibhausgasemissionen reduzieren können, und selbst dort scheint sich die Dynamik in letzter Zeit abzuschwächen. Die Emissionen pro Kopf und pro Fläche unterscheiden sich jedoch erheblich, wobei die „alte Welt“ ein höheres Niveau an landwirtschaftlicher Nutzungsintensität als die „neue Welt“ aufweist. Diese Umstellung der Produktionsweise bewirkte, dass Brasilien, die USA und die EU in verschiedenen Bereichen und in unterschiedlichem Ausmaß den Umfang ihrer Nahrungsmittelschüsse erhöht haben. Im Gegensatz dazu vergrößerten Afrika und Asien in Allgemeinen ihre Defizite: erstere bei Lebensmittelsektore und letztere bei Futtermitteln und tierischen Erzeugnissen. Diese Tatsachen weisen eindeutig auf eine unbequeme Wahrheit hin, nämlich dass wir weltweit mit weniger mehr produzieren müssen. Deshalb kommt es sowohl auf eine wirtschaftliche als auch auf eine ökologische Effizienz an.