

Resilience and transformation.

Resilience of the UK's local food sector to the first wave of the COVID-19 pandemic.



Stephen Jones

Anna Krzywoszynska

Damian Maye

About this report

This report is an output from 'The local as a site of food security resilience in the times of pandemic: opportunities, challenges and ways forward' project, funded by the Economic and Social Research Council (ES/V004107/1) under the UK Research and Innovation Open Call on COVID-19.

The study was led by Dr Anna Krzywoszynska from the University of Sheffield (now University of Twente), and Prof Damian Maye from Countryside and Community Research Institute at the University of Gloucestershire.

Please reference this report as follows: Krzywoszynska, A., Jones, S., Maye, D. (2022) Resilience and transformation. Resilience of the UK's local food sector to the first wave of the COVID-19 pandemic. DOI: [10.5281/zenodo.6379966](https://doi.org/10.5281/zenodo.6379966)



The University
Of Sheffield.
Institute for
Sustainable Food.



CCRI

COUNTRYSIDE
AND COMMUNITY
RESEARCH INSTITUTE

Table of Contents



1. EXECUTIVE SUMMARY	4
2. INTRODUCTION	6
3. METHODOLOGY	8
4. FINDINGS. RESILIENCE AND VULNERABILITY	11
4.1 Diverse impacts of Covid-19 on local food chains	11
4.2 Characteristics contributing to the resilience of local food actors	13
4.3 The role of social capital in achieving resilience	15
4.4 The increased importance of the online sphere	17
4.5 Characteristics contributing to vulnerability	17
5. FROM RESILIENCE TO TRANSFORMATION?	21
6. CONCLUSIONS	25
REFERENCES	27

1. Executive summary



The start of the Covid-19 pandemic in 2020 had a profound and diverse impact on the local food sector in the UK. In this report, we draw on original qualitative data (interviews and document analysis) to better understand the resilience of local food actors (LFAs) to this event. Across the case studies, we find that LFAs were able to be resilient due specific characteristics: flexibility and rapidity, adaptability, diversity, and redundancy. We further find that these resilience characteristics were enabled by the LFAs social capital. LFAs which were lacking those characteristics and which had weak social capital were found to be more vulnerable.

On the positive side, some local food system actors were able to exploit gaps in the dominant food system to expand their reach or otherwise strengthen their businesses. Many also benefited from an influx of new volunteers. Other actors experienced serious disruptions to their livelihoods due to pandemic-related regulations (e.g. closure of food markets). There was a pronounced shift to the online sphere across the sector. There was also a shared sense of lack of support from, or indeed experiences of being

hindered by central authorities. Across the board, the 2020 pandemic was experienced as a 'baptism of fire' and a source of intense stress for LFAs.

We also investigated the extent to which the local food sector could be a source of transformation of the UK's food system following the pandemic disruption. We found that there is little structural support for such a shift, with little recognition of the transformative potential of the local food sector in mainstream policy. Further, we find that the sector appears to be suffering from a 'middle class image problem'. This is an obstacle in building a broader political recognition of the many benefits which the local food sector could bring to the UK food systems in the future.

2. Introduction.



How to ensure resilience of food systems is a key concern in the wake of the COVID-19 pandemic. There is a renewed interest in the role of local food systems from policy, academic, and third sector actors, who see those systems as a source of resilience. However, the capacity of the local food sector to provide resilience depends on the resilience of the local food actors themselves, which has been little investigated to date.

In this project we sought to address this gap and investigate the resilience of UK local food actors to the first wave of the COVID-19 pandemic (Jones et al. 2022). Whereas previous analysis of resilience focused on the presence or absence of specific resilience attributes or characteristics, in this project we were further interested in understanding what enables local food actors to achieve or activate such characteristics. Consequently, our analytical strategy combined an attention to

resilience characteristics with an interest in various forms of social capital. In addition, we analysed key policy documents to understand systemic opportunities and barriers.

In order to ensure the relevance of our research questions and approach to the concerns of the local food sector, we co-designed our methodology an Advisory Board composed of experts in the local food sector. The Advisory Board included representatives from the following organisations: Better Food Traders, Community Supported Agriculture Network, Farm Retail Association, Food Farming and Countryside Commission, The Landworkers' Alliance, Open Food Network, Pasture-fed Livestock Association, Royal Agricultural University, Social Farms & Gardens Wales, Sustain, Sustainable Food Places and The Soil Association.

3. Methodology.



Following the first Advisory Board meeting, the decision was made to commence data collection by conducting qualitative interviews with key stakeholders from across the UK local food sector. This would provide a rich understanding of the complex impacts that COVID-19 was having across the various business types and organisations.

The interviews were conducted online between July and November 2020, were semi-structured, and lasted between 60 and 90 minutes. This report draws on the material from 31 interviews with stakeholders from the following elements of the local food sector:

- Farmers' markets
- Farm shops / farm direct sales
- Grow your own
- Local independent shops

- Box schemes
- Community Supported Agriculture
- Community gardens
- Local Food Partnerships
- Local procurement schemes – that sell to public institutions such as schools and hospitals
- Direct sales via online platforms
- Food hubs
- Research organisations monitoring local food responses to COVID-19

The interviews focused on the experiences of local food actors (henceforth LFAs) in the first wave of COVID-19, explicitly investigating the presence of characteristics, capabilities or attributes previously identified in literature on food systems resilience (Hodbod & Eakin, 2015; Jüttner & Maklan, 2011; Moser et al., 2019; Tendall et al., 2015):

- Flexibility – the ability to adapt to and exploit shocks and disturbances
- Rapidity (or velocity) – the speed at which changes can be implemented
- Redundancy – having spare resources that can be drawn upon during a disturbance
- Collaboration – the ability to connect with others and work effectively together
- Diversity – or multifunctionality, i.e. having a broad range of alternatives to reduce vulnerability to the loss of specific elements
- Learning capacity – the ability to draw on previous experiences of shocks, or the knowledge of others, and apply this to a new situation

In addition to these, the interviews investigated the role of social capital, both as a resilience characteristic in its own right, and as enabling some of these other characteristics.

We also conducted a thematic analysis of 30 key reports in order to understand how the local food sector was approached in current policy and third sector debates. The

documents included all recent public reports and policy statements (published 2019 – 2021) that: concerned either specifically local food, or the current state of the UK food system more broadly; examined how the UK food system responded to COVID-19; and/or discussed the future of the UK food system.

4. Findings.

Resilience and vulnerability in the UK's local food sector.

4.1 Diverse impacts of Covid-19 on local food chains

The various actors within the local food system experienced different impacts of the pandemic and the associated policy regulations. Box schemes, online direct sales, farm shops, food hubs and local independent shops experienced a huge surge in demand following the start of lockdown in March 2020.

“...and very quickly we saw the subscriptions go from about 300/350 up to 650 in 5 days.” (Box Scheme)

These local food actors felt that they had been successful during this period because they had filled or been able to exploit 'gaps' in the central food system. The respondents reflected that these 'gaps' had included:

- Supermarket supply chain issues and 'empty shelves';
- Supermarkets not having enough home delivery slots;
- That smaller local shops felt safer, less busy, and more personal;
- Certain vulnerable people and communities were missed or were not adequately provided for by the central food aid response.

As lockdown measures were eased over the summer 2020, this demand steadily but significantly dropped off. However, these organisations and businesses were still experiencing a higher demand than before lockdown and were optimistic that they would be able to retain a proportion of these new customers.

Local food producers that supplied schools, restaurants and the hospitality sector were negatively impacted by the forced closure of these sectors.

Farmers' markets as well as traditional indoor and outdoor markets have been particularly negatively affected. Although legally permitted to carry on operating as essential businesses, those operating on local authority spaces were often still ordered to close.

Interviewees involved in local food markets that had stayed open throughout the pandemic, or that reopened recently at the time of the interview, reported that they have seen a significant reduction in footfall and business.

"We normally get about 1500 people through the door and I think that day we saw a couple of hundred people. So I can remember very clearly just standing outside the hall just going 'I'm going to have to go home', you know just in bits... we're standing here going like 'God it's dead, there's no-one here'. So it was really, really difficult, and that was the last market we ran." (Farmers' Market)

Local food businesses and organisations were having to cope with the impact of staff and volunteers having to self-isolate because they are shielding or have come into contact with the disease itself.

However, for many local food organisations the negative impacts of staffing availability were minimised because of an influx of volunteers which were available as a consequence of the government furlough scheme and university closures.

Community gardens in open public spaces were forced to close and so were not tended during the height of lockdown.

Events such as food shows, fairs and festivals have been cancelled which has been a huge loss for both the operators and local food traders that relied upon them.

Community food partnerships have seen a large increase in demand on their services in order to address increasing food insecurity.

The diversity of impacts which COVID-19 is having across local food businesses was and is largely dictated by the extent to which government guidance effected the businesses operations. However, there are also a number of characteristics or traits which mean that certain local food businesses are more resilient than others.

4.2 Characteristics contributing to the resilience of local food actors

Through the interviews we identified the following traits and characteristics that enabled some local food actors to be resilient to the impacts of COVID-19:

Flexibility and rapidity

Local food businesses showed themselves to be flexible and adaptable in several ways over the course of the pandemic. There were many examples of how local food actors had embraced new forms of technology and ways of operating. They were able to rapidly introduce changes to their workforce, the way they used spaces and their supply chains.

“So an awful lot of the guys that I worked with prior to COVID, a lot of them were slightly old fashioned in their approach to things, people handled cash, they didn’t have an online presence, yeah they were quite kind of old fashioned in their approach to their business. I was absolutely amazed at how many of those guys just acted so quickly. They went online, they had contactless before you could say ‘how much is that’, the payment card machines, they’d set up delivery systems. And so an awful lot of them adapted really, really quickly, which was great for them.”
(Farmers’ Market)

Adaptability: flexibility of ‘local values’

Local food businesses established connections with new suppliers that didn’t share their values (perhaps they are not organic, or based further away from them than they would ideally have preferred). But compromising on these values and working with these suppliers has allowed them to meet the increased demand for produce.

“we umm’d and arhh’d a lot about this but in the end we ended up putting on our shop front a sort of like non-seasonal....because everything about what we do is local, seasonal etc, but we actually had such a demand from people who didn’t want to go to supermarkets that we put together from a local wholesaler a bag of fruit. So this was, you know apples, pears, not necessarily local obviously or seasonal but it was all based around nutrition.” **(Food Hub)**

Diversity and modularity

The local food businesses that demonstrated the most resilience often had diverse and multi-faceted (or modular) operations. This included, for example, market traders with a pre-existing online delivery service, farm shops with cafés or independent shops that also ran vegetable box scheme. These businesses could cope with one aspect of their business being closed (such as a café or an events business) because they could focus on other parts of the business that were allowed to operate and was experiencing increased demand, such as food boxes schemes, online delivery services or shops.

Redundancy

Another key factor that influenced the resilience of local food businesses was their capacity to scale up operations in the face of increased demand. In most cases in our sample, local food businesses had redundant resources available to increase the scale of their operations (at least to some extent) and have taken up more orders and processed them. However, in other cases, local food organisations were already working at their capacity before COVID-19 and so have not been able to do any more than this during the pandemic.

“We’re at capacity there. We were at 1500 [veg box orders] pre-lockdown, and then that happened and we just sort of maxed out. So we don’t have space to pack any more at the moment. Yeah we could do with moving to a larger space in the not too distant future.” (Vegetable box scheme)

4.3 The role of social capital in achieving resilience

The interviews indicated that the resilience characteristics described above could be activated thanks to the LFAs social capital. Social capital can be understood the value of networks and relationships in a group or community. It includes “features of social organization, such as networks, norms, and social trust, that facilitate coordination and cooperation for mutual benefit” (Putnam 1995, cited in Bernier & Meinzen-Dick, 2014, p. 1). Bonding social capital relates to the strength of within-group relations, while bridging social capital relates to the strength of (or capacity to create new) cross-group relations.

Bonding social capital

Thanks to the presence of bonding social capital, LFAs were able to create cooperation quickly and effectively between members of their immediate groups. The interviewees reflected that as LFAs were made up of relatively small but “tight” teams (Local Independent Shop), with a strong sense of group identity and goals, they were well placed to “really pull together” (Food Hub) to implement changes quickly. Bonding

capital has also been evident through the use of group video calls, Facebook and WhatsApp groups by LFAs involved in the Grow Your Own and Community Garden sectors. These online groups were used as a way to share experiences, ask questions and maintain some of the social aspects of these groups that had been largely lost because of social distancing.

Bridging social capital

Thanks to the presence of bridging social capital, the LFAs were able to reach beyond their immediate groups and strengthen their resilience by connecting with others. Having a diverse network of pre-existing connections and the capacity to establish new contacts during the pandemic enabled local food actors to be resilient. This connectivity was crucial to maintaining and adapting local food supply chains, for example in finding an outlet for surplus restaurant food. Further, an increase in online connectivity through webinars and social media groups allowed local food actors to share and learn from one another's experiences and provide moral support.

A further way in which LFAs were able to use their strong bridging capital was recruiting new volunteers and staff. LFAs often had to deal with their regular staff and volunteers having to self-isolate because they were shielding or had come into contact with the disease.

Similarly, this strong bridging capital meant that a number of LFAs we spoke to were granted temporary permission to use extra space (such as car parks or town halls) that were not being used by other local businesses or groups because of lockdown restrictions. Overall, the strong bridging and bonding capitals of LFAs meant that they were able to establish connections with new people, businesses and groups, allowing them to be persistent and adaptable.

4.4 The increased importance of the online sphere

Local food supply chains were also transformed structurally during the pandemic. This is associated with the trends for increasingly moving online and establishing new connections with one another.

During the pandemic, online platforms that link local food producers, traders and hubs together have seen a significant increase in use. The local food networks that have emerged from this have resulted in the local food supply chains becoming more regionalised. This has enabled food producers to find new markets and for food hubs to become increasingly resilient through having a larger and more diverse supply chain.

“So what’s happened particularly in the south-west is... connecting the hubs with each other and connecting producers who wouldn’t necessarily have enough produce to sell regionally – they might have enough to sell to one local hub or possibly two local hubs, but they now have the potential to....because the hubs are starting to trade with each other those producers suddenly have a much bigger market.” (Direct Sales Platform)

4.5 Characteristics contributing to the vulnerability of local food system actors

As well as the examples of resilience described in the previous section we also found instances where certain LFAs had shown vulnerabilities to the impacts of COVID-19. Our analysis found that these vulnerabilities were the result of a lack of certain resilience characteristics, which were frequently linked with weakly developed aspects of social capital.

Lacking redundancy

The amount of redundancy an LFA possessed strongly informed their capacity to adapt, expand and fully take advantage of the surge in demand for local food. An extreme example of this came from a community supported agriculture (CSA)

scheme, which was unable to take on any new members as it was already working at their full capacity before COVID-19.

More commonly, LFAs did have some redundancy available, but were limited in the extent to which they could expand. Box schemes and online based delivery services, for instance, often had to place caps on the number of orders and customers because of the space and workforce capacity, including limitations due to social distancing requirements.

Limited diversity

Market traders, farmer markets and farm shops whose customer interface was not diverse, i.e. which depended on in-person interactions only, struggled to set up online business presence from scratch at a short notice.

Diversity of supply chains was also key. LFAs that produced fresh vegetables, or exclusively sourced UK grown vegetables, faced the problem that the start of national lockdown in March 2020, and the linked surge in demand, coincided with the annual “hungry gap”: the time when autumn and winter crops have already been consumed, but spring crops are not yet available. Thus certain LFAs faced increased demand at the time when UK vegetable producers were least able to meet it.

Whilst some LFAs were able to source food from overseas, others were less willing to be flexible in their ‘local’ values. This problem was further exacerbated by supermarkets and other large-scale buyers who, in response to their own supply issues, were approaching local producers and “hoovering up” remaining produce (Local Independent Shop) in an unusual competition with the LFAs.

“I think the processing plants were very anxious and were finding it very difficult to actually produce to the levels that the supermarkets needed... [They] wanted everything now and they didn’t mind paying more, and we just didn’t deal with them, you know we just said ‘no, sorry’... there were three of them that spring to mind that were phoning and just being quite aggressive about it” (Fish Box scheme)

Issues with social capital

Some LFAs suffered due to local food economies being perceived as “a leisure pursuit as opposed to essential retail” (Farm Shop), “middle class” (Community Gardens) and “hobbyist” (Local Food Partnership). This seems to have been a particular issue for farmers’ markets during the first 2020 lockdown, who also experienced backlash on social media.

“...when I posted [an advert for an upcoming farmers’ market] in the local community group there was a few people, mainly people who haven’t attended the market, who were quite negative and quite, you know ‘this isn’t essential and you shouldn’t be doing this’... and there was a few people saying like ‘oh why, because you’re artisan beer and sausages’ and blah, blah, blah ‘that’s not essential’.”
(Farmers’ Market)

There was also an apparent lack of support from local and central government for LFAs. Several of the interviewees commented on a lack of guidance and support from local authorities. In some cases, local authorities indeed placed direct restrictions on LFAs’ ability to operate, such as not allowing farmers’ markets to remain open.

LFAs also found support to be lacking from central government, as they were often ineligible for COVID-19 linked business grants and financing schemes. In contrast, the centralised food system was seen as a major recipient of government support at all levels.

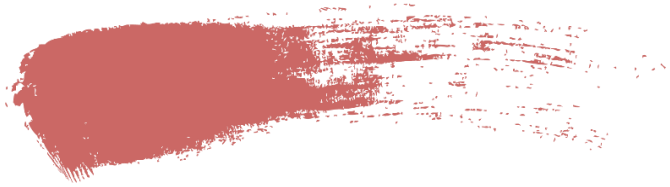
The physical and psychological toll of responding to the COVID-19 pandemic

The sustained efforts of LFAs to work at capacity (and in many cases push beyond it by working longer hours) was widely reported by interviewees (see also Sanderson-Bellamy et al. (2021)). Those LFAs that saw a sudden increase in demand described their experience as being “traumatic”, “overwhelming”, “exhausting”, “stressful”, “a baptism of fire”.

“It was traumatic to say the least. So our food hub was sort of like bimbbling along, sort of steady growth, between 70/80 orders a week, that sort of thing, lots of

different customers who would dip in and out of it. And then first week of lockdown we had 5 times the number of normal orders that we normally have. And people ringing us up, desperate, you know vulnerable people with health conditions who couldn't get a delivery from the supermarket. They were just sort of like telling us all their health conditions... sounding really desperate" (Food Hub)

5. From resilience to transformation?



A The COVID-19 pandemic, some argue, presented an opportunity for positive transformation of the UK food system (Sanderson Bellamy et al., 2021). It could be seen as an opportunity for LFAs to take a more prominent role, and for the overall food system to become more diverse and resilient as a result. The resilience of UK LFAs discussed in the previous section demonstrates their potential for achieving such a transformative effect. However, there is little evidence of such a shift so far (Mitchell et al., 2020). Our interviews provide an indication of why the local food sector did not become an engine of transformation for UKs food system as a result of the COVID-19 pandemic. We review those below, and suggest that the shift from resilience to transformation for the local food system must address its 'image problem' to enable it to generate greater political capital.

Poorly developed aspects of social capital

Whilst a “middle class” image caused problems for certain LFAs such as farmers’ markets, this also has broader consequences, preventing LFAs from being transformative on an on-going basis. It seems that LFAs can have the ‘wrong kind’ of social capital to enter mainstream policy debates, which undermines their capacity for political action.

“It’s really complicated in Bristol because obviously we have a Mayor and he is great but he’s entirely, and understandably, equalities focused (...) And there is a little bit of a sort of foody bubble in Bristol that’s quite white and middle class, and he’s quite anti that white middle class thing. And he tends to put anybody that’s talking about food in that bubble.” (Community Gardens)

The ‘image problem’ LFAs suffer from seems to prevent the building of linking social capital which would enable the sector to act politically and influence policy.

Addressing this perception of being a niche middle class hobby and showcasing the significant societal and food security contribution of LFAs then emerges as a key area for further action.

Systemic factors

The second set of factors which prevents LFAs from being transformative relates to systemic factors and power structures beyond their immediate control. The documentary analysis component of our research revealed systemic factors preventing the kind of transformation that might see LFAs take a larger role in the UK’s food system (for a further discussion, see Black et al. 2022).

Whilst one UK Parliament research briefing paper (Llanos & Border, 2020) notes a more resilient UK food system could be achieved through greater diversity, and that this diversity could involve a greater role for local food, such consideration was lacking from the more prominent reports. For example, a serious consideration of the local food sector was not included in The National Food Strategy (Dimbleby, 2020, 2021) or the report by the Select Committee on Food, Poverty, Health and the Environment

(House of Lords, 2020). In the National Food Strategy (2021), procurement features as a key mechanism to allow smaller producers to access public food contracts, but there is no consideration of local food in the Strategy's transformative ambitions. Notably, despite engaging extensively with the impacts of COVID-19 on the UK food system, these reports fail to mention the contributions to food security made by LFAs.

No consideration is given to the prospect of moving towards a more territory-based food system in the future.

This limited consideration of the potential role of local food in the policy sphere is a significant obstacle preventing LFAs from being transformative. It is important to recognise that food system transformation can often be driven by shocks and disturbances (Pereira et al., 2020), and that the first COVID-19 wave certainly wasn't the end of those. Our turbulent and uncertain future presents an opportunity for LFAs to be transformative, but concerted effort is required to address the weaknesses in LFAs' social capital and the systemic factors which have so far prevented this.

The way forward

In order for local food actors to take a more prominent role in UK food system, the local food sector needs to enhance their political social capital.

Hunt (2015) argues this demands building more effective coalitions, and during the pandemic we observed significant activity among local food and broader sustainable food movement campaign groups in this vein. Still, we find that political social capital needs to be further harnessed. What is most pressing is alliances that move local food beyond a single issue topic (defensive localism) and instead articulate local food as part of place-centred community resilience strategies that foster social capacities. This also mobilises localism across multiple issues (climate change, biodiversity, wellbeing, etc.) to address systemic food system challenges.

We see this happening already through local food partnerships and community food networks. These social capital building mechanisms have untapped potential to influence policy and unlock the transformative capacity of local food systems.

6. Conclusions



We found that the impacts of the 1st wave of COVID-19 were diverse, with some LFAs thriving whilst other struggled to survive. LFAs resilience was influenced by their resilience characteristics as well as aspects of social capital. Contributing to LFAs vulnerability was the sectors' overall lack of political capital, which was further hampered by the image problem of local food as 'a middle class hobby'. This lack of political capital has meant LFAs have so far been unable to use the shock of COVID-19 to drive a food system transformation.

In the light of these findings, we argue that the local food sector needs to form alliances which would move it beyond a single issue topic, and articulate local food as part of place-centred community resilience strategies that foster social capacities. The UK was lucky to have LFAs to 'plug the gaps' in the food system during the crucial first weeks of COVID-19. The adaptability of LFAs during the first wave of COVID-19 highlights the potential for the UK local food sectors to be a source of resilience in times of crisis. However, even the LFAs that adapted well to the shock of the pandemic have done so by taking on unsustainable and stressful workloads, potentially undermining their capacity in the long run.

References

Bernier, Q., & Meinzen-Dick, R. (2014). *Resilience and social capital (Vol. 4)*: Intl Food Policy Res Inst.

Black, J. E., Maye, D., Krzywoszynska, A., Jones, S., (2022) How is 'the local' framed in UK system food debates? A review of mainstream and local food sector reports during the Covid-19 pandemic. DOI: 10.5281/zenodo.6378946

Dimbleby, H. (2020). Part One - The National Food Strategy. Retrieved from <https://www.nationalfoodstrategy.org/wp-content/uploads/2020/07/NFS-Part-One-SP-CP.pdf>

Dimbleby, H. (2021). The Plan. The National Food Strategy. Retrieved from https://www.nationalfoodstrategy.org/wp-content/uploads/2021/10/25585_1669_NFS_The_Plan_July21_S12_New-1.pdf

Hodbod, J., & Eakin, H. (2015). Adapting a social-ecological resilience framework for food systems. *Journal of Environmental Studies and Sciences*, 5(3), 474-484.

House of Lords. (2020). *Hungry for change: fixing the failures in food - Report of Session 2019-21*. Retrieved from <https://committees.parliament.uk/publications/1762/documents/17092/default/>:

Hunt, A. R. (2015). *Civic engagement in food system governance: A comparative perspective of American and British local food movements*: Routledge.

- Jones, S., Krzywoszynska, A. & Maye, D. (2022) Resilience and transformation: Lessons from the UK local food sector in the COVID-19 pandemic. *The Geographical Journal*, 00, 1- 14. <https://doi.org/10.1111/geoj.12428>
- Jüttner, U., & Maklan, S. (2011). Supply chain resilience in the global financial crisis: an empirical study. *Supply Chain Management: An International Journal*.
- Llanos, J., & Border, P. (2020). A resilient UK food system. POSTNOTE. Retrieved from <http://researchbriefings.files.parliament.uk/documents/POST-PN-0626/POST-PN-0626.pdf>
- Mitchell, R., Maull, R., Pearson, S., Brewer, S., & Collison, M. (2020). The impact of COVID-19 on the UK fresh food supply chain. arXiv preprint arXiv:2006.00279.
- Moser, S., Meerow, S., Arnott, J., & Jack-Scott, E. (2019). The turbulent world of resilience: Interpretations and themes for transdisciplinary dialogue. *Climatic Change*, 153(1-2), 21-40.
- Pereira, L. M., Drimie, S., Maciejewski, K., Tonissen, P. B., & Biggs, R. O. (2020). Food system transformation: integrating a political–economy and social–ecological approach to regime shifts. *International journal of environmental research and public health*, 17(4), 1313.
- Sanderson-Bellamy, A., Furness, E., Nicol, P., Pitt, H., & Taherzadeh, A. (2021). Shaping more resilient and just food systems: lessons from the COVID-19 Pandemic. *AMBIO: A Journal of the Human Environment*.
- Tendall, D. M., Joerin, J., Kopainsky, B., Edwards, P., Shreck, A., Le, Q. B., . . . Six, J. (2015). Food system resilience: Defining the concept. *Global Food Security*, 6, 17-23. doi:<https://doi.org/10.1016/j.gfs.2015.08.001>