FRC Discussion Paper

Sustainable Food Hubs: A route to just food from agroecological food systems

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July 2021

Series Editor:
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Food Research Collaboration

an initiative of

Centre for Food Policy

Shaping an effective food system

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Abbreviations

CPRE	The Countryside Charity, formerly known as the Campaign to Protect Rural England
Crovecia	The International Crossroads Centre
FAO	The Food and Agriculture Organisation of the United Nations
FoEI	Friends of the Earth International
IPBES	The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	The Intergovernmental Panel on Climate Change
LWA	The Landworkers' Alliance
SFH	Sustainable Food Hub
TGL	Tamar Grow Local
TNI	Transnational Institute
WWF	The World Wide Fund for Nature

Introduction

Our food system is in crisis. Both perpetrator and victim of the climate and biodiversity crises, and producing an abundance of food that is wasted and unfairly distributed, agriculture needs to be reimagined in a way that centres ecological and social justice. The sustainable food movement and the food justice movement have, for many years, run on parallel tracks, but in the wake of the Covid-19 pandemic, the two have collided. Projects are beginning to emerge that hope to address the environmental impacts of our food system and overcome food insecurity and health inequalities in local communities. However, it is not easy to juggle the needs of the farmer, the eater, and the countless other people who are impacted by our food system. This report looks at the role of sustainable food hubs, and how they might help the UK navigate towards an agroecological food system by providing short supply chain infrastructure, overcoming barriers to entry into farming, and integrating business models that help combat food insecurity and health inequalities.

"The sustainable food movement and the food justice movement have, for many years, run on parallel tracks, but in the wake of the Covid-19 pandemic, the two have collided."

Why do we need an agroecological food system?

There is no denying modern agricultural systems successfully produce large volumes of food, with the value of global agricultural crop production tripling since 1970.[1] However, productivity has come at the cost of vital natural processes that make food production possible, and staple crop production is already showing signs of stagnating.[2] Even in abundance, the conventional food system remains inequitable, wasteful, destructive to nature, and catastrophic for the climate.

Land, climate, and nature

Land degradation, driven in large part by unsustainable agriculture, is negatively affecting the wellbeing of 3.2 billion people, costing more than 10% of global gross product annually, and driving nature towards a mass extinction event.[3] Conventional tillage practices are eroding soils at more than 100 times the soil formation rate, and soils under conventional agriculture are a continued source of greenhouse gas emissions.[4] Whilst 821 million people are undernourished, 25-30% of food produced globally is wasted, using up roughly 10% of the world's energy consumption.[5,6] Land use contributes to around 25% of anthropogenic greenhouse gas emissions, and the food system as a whole is responsible for up to 37%.[7,8] To avoid further climate change, and potentially triggering devastating tipping points in

global systems, it is vital that waste and emissions are dramatically reduced in the food system.

Agriculture is a key driver of biodiversity loss globally. Excessive application of nitrogen fertilisers has produced harmful algal blooms and over 400 hypoxic or 'dead' zones in the world's waters, covering over 245,000 km² by 2008.[9] Pesticides disrupt biodiversity and undermine the health of entire ecosystems as well as key species such as pollinators that we rely on for food production.[10,11] Agriculture is the single greatest cause of forest degradation and deforestation worldwide, with serious consequences for biodiversity and climate change.[12] Individual species and entire ecosystems are jeopardised by current agricultural practices, along with the societies that rely on them.

Biodiversity is threatened not only in wider ecosystems, but also within agriculture. By 2016, over 9% of the domesticated breeds of mammals that are used for agriculture and food had become extinct.[13] The Food and Agriculture Organisation of the United Nations (FAO) estimates that about 75% of crop diversity was lost throughout the 21st Century; and more than 50% of the global food supply now consists of just three crops.[14,15] What genetic diversity does remain in food crops is a credit to indigenous and local communities who continue traditions of seed saving,

Definitions

Sustainable food hubs

Food enterprises that source food directly from multiple producers, aggregate the produce, and sell it on to eaters, while applying a set of standards or values that uphold sustainability principles to their sourcing and how they operate.

Agroecology

'An integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems. It seeks to optimise the interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system.'[1]

Agroecological food system

A food system that, amongst other things, increases internal resource cycling, improves resilience, is multifunctional, complex, and integrated, and focuses on local contexts, equity, and nourishment.[2]

Short food supply chains

Supply chains with a reduced number of intermediaries between producer and consumer. This can, but does not necessarily, imply shorter physical distances, and altered social relations within the supply chain.

1. FAO. (2018). The 10 Elements of Agroecology: Guiding the transition to sustainable food and agricultural systems. Rome, Italy. Retrieved from http://www.fao.org/documents/card/en/c/I9037EN

2. Vaarst et al. (2018). Exploring the concept of agroecological food systems in a city-region context, Agroecology and Sustainable Food Systems, 42(6), 686-711. doi.org/10.1080/21683565.2017.1365321

despite increasingly concentrated ownership and production of seed.[16,17] Reduced diversity undermines the resilience of agroecosystems and makes them vulnerable to pathogens, pests and climate change.[18,19]

Social Justice

The food system in the UK is also rife with injustices, both upstream and down. Britain retains what has been described as a 'neo-imperial' attitude to food provision, relying heavily on imported goods with little redress for the land, water, labour, energy, and emissions embedded in these foodstuffs.[20] The World Wide Fund for Nature (WWF) reports that the UK imports 46.4 billion cubic metres of water every year in agricultural products.[21] That means 62% of the water embodied in agricultural products that are consumed in the UK is imported, with considerable contributions from water-scarce regions such as India and Ghana.[22] The UK has also been described as 'one of the main destinations of trafficked workers in Europe'.[23] Agricultural workers in the UK are particularly vulnerable to exploitation and modern slavery, with hundreds of thousands of agricultural workers each year employed on a seasonal or casual basis, with examples of traffickers exploiting potentially hundreds of people at a time for agricultural labour.[24,25]

Despite going to such extremes to keep food prices low, the UK fails to uphold citizens' right to food. Food continues to be treated as a commodity to be distributed by the market, whilst welfare cuts in the last decade have created a boom in food bank usage.[26] The consequence is that, even prior to the outbreak of Covid-19, 8-10% of UK households were food insecure, with 700,000 households using food banks in the year leading up to the pandemic.[27] Prior to the Covid-19 pandemic, over 20% of Londoners and 17% of parents in London already lived with low or very low food security.[28] Roughly 16% of the population of Great Britain live in food deserts: 'areas which are poorly served by food stores, particularly those selling fresh, healthy products'. The impact of this is disproportionately experienced by disadvantaged and marginalised groups; hence the emergence of the term 'food apartheid' rather than 'desert'.[29,30] The pandemic has since increased inequalities in nutrition and food security across the UK.[31]

Summary

The global food system is a leading cause of, and incredibly vulnerable to, the twin threat of climate and biodiversity crises. The UK continues to export the impact of our food consumption to other countries, whilst hundreds of thousands of households back home struggle to eat. It is crucial that the food system undergoes a transformative change that can address these many challenges.

What is agroecology?

The food system needs a transformative change that will help avert the climate and biodiversity crises and address the inequalities embedded in the current system. Agroecology is proposed as an approach to food and farming that not only works more closely with nature, enhances diversity, and reduces dependence on inputs, but also establishes shorter food supply chains that are responsive to local needs and promote local economic and ecological resilience.[32] Formalised by the International Planning Committee for Food Sovereignty at the Agroecology Forum in 2015, the concept is nevertheless difficult to pin down.[33] Part practice, part science, part social movement, it

integrates diverse knowledge systems to focus on ecological and social outcomes of food systems. This tends to translate into shorter supply chains; more, smaller farms; more equitable markets; and massively reduced dependence on inputs.[34,35] Far from being a fringe concept, agroecology has been acknowledged by the Intergovernmental Panel on Climate Change (IPCC) as a key mechanism to adapt to and to mitigate climate change, and by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) as a complementary way to both feed humanity and conserve natural resources. [36,37] WWF recognises that adopting agroecological practices can conserve natural resources, enhance biodiversity, and prevent degradation of soil and the environment, all whilst increasing productivity year on year.[38]

Importantly, the values of agroecology extend beyond the farm and can be applied across the food system. An agroecological food system has been defined as one that, amongst other things, increases internal resource cycling, improves resilience, is multifunctional, complex and integrated, and focuses on local contexts, equity, and nourishment.[39] The FAO identifies circular and solidarity economies as key elements of agroecology, alongside specific farming practices, highlighting how agroecology is fundamentally a systems approach that has societal impacts beyond the farm gate.[40] The marriage of the ecological and the social is central to agroecology, resulting in criticism from civil society where corporations are seen to be adopting agroecology without the social justice elements.[41]

"...the values of agroecology extend beyond the farm and can be applied across the food system."

Agroecological food systems, then, seem an appropriate avenue for the UK to explore in order to address the many failures of our current food system, but such a transformation is not straightforward.

Why don't we have an agroecological food system?

A key stumbling block for transitioning to an agroecological food system in the UK is the creation of more, smaller, and more diversified farms connected by shorter supply chains. Land, training, and finance are difficult to access for those who are trying to enter and transform the sector, and many people continue to feel unwelcome in rural and agricultural spaces.

Access to Land

A study of new entrant farmers carried out by the Landworkers' Alliance (LWA) found that 61% struggled to buy or rent land.[42] Landownership in England and Wales is highly concentrated, with 30% held by the aristocracy, and 50% owned by less than 1% of the population.[43] The cost of

farmland has grown enormously in the last two decades. Seen as a 'safe-haven asset' that can be relied on when financial markets are struggling, average British land price increases accelerated during the 2007/8 financial crisis, stabilising in the last five years at around £7,000 per acre, up from around £2,000 per acre at the beginning of the 21st Century.[44] The market for farmland remains competitive. Estate agent Knight Frank reported that for the third quarter of 2020, 36% of buyers of farmland were 'lifestyle buyers', and investors purchased nearly 20% of farmland sold.[45] County farms – plots of agricultural land owned by local authorities and rented out at more affordable prices – are being rapidly sold off, and with them, vital opportunities for new entrants.[46]

Training and Finance

Land access is not the only hurdle to overcome in order to establish more, smaller farms in the UK. 54% of new entrant farmers surveyed by the LWA struggled to access relevant training.[47] This is due to a lack of accredited courses in sustainable agriculture, and costs associated with the few that are available. Affordable training that is available can be lacking in crucial areas such as year-round planning and training, business management, and opportunities on a commercial scale.[48] It was also reported that 46% of new entrants found access finance to be a barrier.[49] Reasons for this include: lack of capital to guarantee the loan; the view that it is uneconomical or inefficient to deal with small businesses; and the lack of evidence of business viability.[50] Lack of available finance alongside insecure tenancies can result in inefficiencies and have impacts for farm infrastructure.[51] For example, short tenancies can disincentivise larger or longer-term investments, such as tree-planting for agroforestry. This in turn can have impacts on soil health, the sustainability of the enterprise and its economic viability.

Exclusion

Inequalities in farming extend beyond access to land, training, and finance. Agriculture has been described as 'the least diverse sector in the UK, with 1.4% of farmers being non-white'.[52] In a webinar on Race and Farming in the UK, Lutfi Radwan of Willowbrook Farm described his experience as a British Muslim farmer:

'... it took us a while to realise it was racism, whether it's issues in getting planning permission, hostility from some neighbours... it's, again, different to an urban environment where some of the racism is in your face. Here, it's very polite racism, it's sort of behind closed doors, it's in committee meetings.'

His family have experienced letters being written against planning applications on the grounds that they are not Christian.[53] David Mwanaka, award-winning writer, journalist and founder of Mwanaka Fresh Farm Foods, has described how when he was renting a farm in Leicestershire, 'the residents saw me working in the field and they just assumed I was stealing corn so they called the police.'[54] To truly enact the social justice dimension of agroecology, all communities must be empowered to take part in all stages of the food system, from production to consumption. In the currently overwhelmingly white agricultural sector, this will require particular attention to minoritised communities.[55]

Summary

There are many hurdles to establishing an agroecological food system in the UK, including, but not limited to, the availability and affordability of agricultural land to establish more, smaller farms; access to appropriate training and finance to facilitate agroecological practices; and the sometimes exclusionary nature of agriculture and rural communities.

Systemic issues highlighted by Covid

In order to create an agroecological food system, agroecological production must be linked up to infrastructure appropriate to the scale and values of agroecology. A network of agroecological farms in the UK will rely on the infrastructure of shorter supply chains to reliably convey their produce to eaters. The Covid-19 pandemic, whilst revealing and intensifying the extent of food insecurity in the UK, also acted as a test for existing short supply chains and the farmers who supply them.[56,57]

During the Covid-19 lockdowns, many producers lost vital trade from the hospitality sector and had to redesign their business models to sell directly to eaters.[58] Simultaneously, veg box sales grew by 111% in the six weeks to mid-April, with smaller box schemes experiencing the biggest growth.[59] This translates to 3.5 million veg boxes being delivered across the UK in that six-week period, though demand was hugely outstripping supply, with 82% of veg box schemes closing to new orders and sitting on long waiting lists.[60] The response to the surging demand for local food was impressive, though ad hoc, and relied heavily on a volunteer work-force, facilitated by the furlough scheme.[61] Whilst attempting to scale-up in a short time period, vulnerabilities in the infrastructure of the sustainable food sector emerged.[62] These included:

- A lack of co-ordination between local businesses.
- A lack of appropriate transportation and storage infrastructure to aggregate supply.
- Uneven access to and literacy in digital infrastructure.

This period also saw new integration of social justice into supply chains, given the rising awareness and severity of household food insecurity. During the first wave of the pandemic, 65% of box schemes prioritised key workers and vulnerable groups, and 10% assisted the economically vulnerable.[63] Others struggled to cater to a wider community; one producer candidly explained:

> *"Something we are very aware of is the fact that there is a large part of our community on lower incomes/lower wealth who cannot afford our produce, as well as people who assume our produce is much more expensive than supermarkets."*[64]

"These shorter chains are potentially well placed to respond to local social justice issues, but currently lack capacity to cope with increased demand."

This same producer has since acquired funding to reconfigure its business model so that its produce is accessible to more members of the local community.

The Covid-19 pandemic thus revealed several issues with and opportunities for existing short supply chain infrastructure. These shorter chains are potentially well placed to respond to local social justice issues, but currently lack capacity to cope with increased demand. This issue needs to be addressed in order to move agroecology from being the 'alternative food system' to being a viable and widespread component of the UK's mainstream food system.

What can sustainable food hubs do?

What is a Sustainable Food Hub?

'Food Hub' is a well-used term with a wide range of definitions. Based on the Food Research Collaboration's previous work on this topic,[65] we use the term 'sustainable food hubs' (SFHs) to refer to food businesses that source food directly from multiple producers, aggregate the produce, and sell it on to customers, while applying a set of standards or values supportive of sustainability principles to their sourcing and how they operate. This covers a range of businesses, from farm shops and community groceries to veg box schemes. The focus is very much on short supply chains, where the hub is dealing directly with primary producers, or with secondary producers with short, transparent links back to the primary producers. For example, sourcing milk directly from the farm (primary), or sourcing cheese from a producer who has sourced milk directly from the farm (secondary).

There is evidence that more localised food production associated with short supply chains has the potential to reduce the climate impact of our food system by reducing greenhouse gas emissions associated with transport and cutting food waste.[66,67,68] Growing Communities, which runs a veg scheme and farmers' market in London, produces an estimated £413,000 of positive environmental impacts annually.[69] The relationship between local food and environmental impact is not, however, simple, and comes with many caveats relating to farming methods, efficiency of transportation and resource use. This can place considerable responsibility on SFHs to source produce based on a number of difficult-to-measure criteria, such as carbon emissions, biodiversity loss and water use.

SFHs, by design, provide the communication, storage, and transport infrastructure necessary to facilitate short supply chains to connect more, smaller farms: a fundamental feature of an agroecological food system. This also helps to address many of the structural issues that were brought to light during the Covid-19 pandemic. By providing a physical or virtual shop front, they spare producers the trouble and expense of having to establish and run their own, and inequalities in digital literacy are reduced. Moreover, the producers are relieved of the necessity of becoming experts in admin, marketing, and logistics on top of their work on the farm, thereby avoiding need for further training.[70]

The following sections consider some of the ways in which SFHs can overcome some of the structural issues which stand in the way of a more agroecological food system, both upstream and down.

Land, training and inclusion

Several SFHs have established programs to directly help create more, smaller farms in the UK, many with a specific focus on agroecological farming methods.

Tamar Grow Local (TGL) is a SFH in the Southwest of England which provides a 'route to market' (i.e., a way of getting produce to eaters) for over 60 local producers. TGL passes 85% of the retail price back to their fresh produce suppliers, and uses the remaining income to support a network of 28 community food projects and businesses, including a 'farmstart'.[71] Farmstarts equip new entrants to farming with access to land, routes to market, training, business support, and vital farm infrastructure such as water access and machinery, thereby helping to overcome several key barriers

to establishing more agroecological farms.[72] OrganicLea in North East London runs a variety of City & Guilds accredited training courses alongside its farmstart, offering more costly 'solidarity' prices to partially subsidise other attendees.[73] The financial barriers faced by many new entrants are also overcome by farmstarts in a variety of ways, such as offering land at below market rates, guaranteeing routes to market, providing agricultural equipment and infrastructure, providing seeds and compost, offering subsidised training, and providing certification.[74]

Improving opportunities for new entrant farmers in agroecological farming could have knock-on effects for the diversity and inclusivity of the sector. The LWA's report on new entrants – the subjects of which were mostly running agroecological enterprises – found that 54% of participants were female, and 17% were not white British, including 9% who identified as 'Black, Brown or Indigenous People of Colour'.[75] This shows considerably more diversity than agriculture more widely in the UK. This should not, however, be taken as a given. Racial justice will require much more proactive work in the sector, especially given worrying reports of exclusionary practices even within projects providing training for new entrants.[76]

SFHs are well placed to help overcome structural barriers to more, smaller, agroecological farms in the UK. Embedding models like farmstarts into their wider business model allows them to absorb some of the risks usually borne by new entrants in the sector, whilst increasing the supply of produce to the hub. However, they must work to ensure that social and racial justice is embedded in the opportunities they provide.

Access and affordability

Opportunities are also emerging for food hubs to address social justice, so central to agroecology, in the communities they serve.

For example, Locavore, a SFH in Glasgow, played a crucial role in the local emergency food response to Covid-19. Not only had it accrued a £5,000 emergency food fund to give to the Community Food Network in Glasgow, but it was also able to supply local, organic staple vegetables at a price comparable to the cheapest conventional vegetables available through wholesale.[77] Another response to food insecurity during the pandemic has been the increase in supply of 'solidarity' vegetable boxes, such as Granville Community Kitchen's Good Food Box. This SFH offers sustainable and culturally appropriate food boxes at two prices: one more costly 'solidarity' box which subsidises a more affordable box.[78] Other community food projects coordinating emergency responses, such as Oxford Mutual Aid, have expressed an interest in, and the capacity to pay for, local, sustainably produced vegetables, if there was a way to access an aggregated supply, for example through a SFH. It had been relying on redistributed food waste through FareShare but hoped to establish a longer-term solution not dependent upon an inherently wasteful system.[79]

"The models emerging out of this crisis suggest that SFHs may not only be able to provide the infrastructure for a transition to an agroecological food system, but that they may also be in a position to directly address the social justice dimension that is so central to agroecology."

Summary

Locality and sustainability remain core values of many SFHs in the UK, but the last 18 months have started to shift greater attention to matters of social justice. The models emerging out of this crisis suggest that SFHs may not only be able to

provide the infrastructure for a transition to an agroecological food system, but that they may also be in a position to directly address the social justice dimension that is so central to agroecology.

"An agroecological food system requires appropriate infrastructure that matches the scale and values of agroecological farming. Sustainable Food Hubs are a crucial part of this infrastructure"

Conclusion

The food system needs to change if we are to avert the threat of the climate and biodiversity crises, and address food insecurity and health inequalities. Agroecological farming could provide a solution, by embedding ecological and social justice into the farming system. This transformation will require more, smaller farms, to which many barriers currently exist, and a network of short supply chain infrastructure. The Covid-19 pandemic has laid bare many of the injustices of our food system, and the limits of the capacity of current sustainable food sector infrastructure.

An agroecological food system requires appropriate infrastructure that matches the scale and values of agroecological farming. SFHs are a crucial part of this infrastructure: aggregators and brokers of shorter supply chains, they can help overcome barriers to establishing more, smaller, agroecological farms, and can integrate projects aimed at overcoming food insecurity and health inequalities. To truly contribute to a more agroecological food system, these SFHs will have to go beyond simply making food more 'local', and embed principles of social and ecological justice into their operations. By providing scale and values-appropriate infrastructure, SFHs can play a fundamental role in transitioning to an agroecological food system.

References

1 IPBES. (2019). Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (pp. XV) Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT%28FIRST%20PART%29_V3_SINGLE.pdf

2 Ray, D. R. (2012). Recent patterns of crop yield growth and stagnation. Nat Commun, 3, 1293. https://doi.org/10.1038/ncomms2296

3 IPBES. (2018). The assessment report on land degradation and restoration of the Intergovernmental SciencePolicy Platform on Biodiversity and Ecosystem Services. (pp. XX) Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/sites/default/files/2018_ldr_full_report_book_v4_pages.pdf

4 IPCC. (2019). Land Degradation. In Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (pp. 347). Retrieved from https://www.ipcc.ch/site/assets/uploads/sites/4/2019/11/07_Chapter-4.pdf

5 IPCC. (2019). Framing and Context. In Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (pp. 89). Retrieved from https://www.ipcc.ch/site/assets/uploads/sites/4/2019/12/04_Chapter-1.pdf

6 FAO. (2018). The 10 Elements of Agroecology: Guiding the transition to sustainable food and agricultural systems. Rome, Italy: FAO. Retrieved from http://www.fao.org/documents/card/en/c/I9037EN

7 IPCC. (2014). Agriculture, Forestry and Other Land Use. In Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (pp. 816). Cambridge, UK and New York, NY, USA: Cambridge University Press. Retrieved from https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf

8 IPCC. (2019). Food Security. In IPCC, Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (pp. 439). Retrieved from https://www.ipcc.ch/site/assets/uploads/sites/4/2021/02/08_Chapter-5_3.pdf

9 IPBES. (2019). Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (pp. XXXII). Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT%28FIRST%20PART%29_V3_SINGLE.pdf

10 ibid.

11 Battisti, L., Potrich, M., & Sampaio, A. R. (2021). Is glyphosate toxic to bees? A meta-analytical review. Science of The Total Environment, 767. https://doi.org/10.1016/j.scitotenv.2021.145397

12 WWF. (2021). Deforestation fronts: Drivers and responses in a changing world. (pp. 7) Gland, Switzerland: WWF. Retrieved from https://c402277.ssl.cf1.rackcdn.com/publications/1420/files/original/Deforestation_fronts_-_drivers_and_responses_in_a_changing_world_-_full_report_%281%29.pdf?1610810475

13 IPBES. (2019). Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (pp. XVI) Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT%28FIRST%20PART%29_V3_SINGLE.pdf

14 FAO. (2011). Save and Grow: A policymaker's guide to the sustainable intensification of smallholder crop production. (pp. VIII) Rome, Italy: FAO. Retrieved from http://www.fao.org/3/i2215e/i2215e.pdf

15 Clapp, J. (2016). Food (2nd ed.) (pp. 48). Cambridge,

United Kingdom: Polity Press.

16 IPBES. (2019). Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (pp. 16). Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT%28FIRST%20PART%29_V3_SINGLE.pdf

17 Clapp, J. (2016). Food (2nd ed.) (pp. 81-106) Cambridge, United Kingdom: Polity Press.

18 Renard, D., & Tilman, D. (2019). National food production stabilized by crop diversity. Nature, 571, 257–260. https://doi.org/10.1038/s41586-019-1316-y

19 IPBES. (2019). Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT%28FIRST%20PART%29_V3_SINGLE.pdf

20 Lang, T. (2020). Feeding Britain: our food problems and how to fix them. (pp. 115-125, 165-166, 226). Pelican UK.

21 WWF. (2008). UK Water Footprint: the impact of the UK's food and fiber consumption on global water resources - Volume One. Retrieved from https://wwfeu.awsassets.panda.org/downloads/wwf_uk_footprint.pdf

22 ibid.

23 The Gangmasters and Labour Abuse Authority. (2018). The Nature and Scale of Labour Exploitation across all Sectors within the United Kingdom. Retrieved from https://www.gla.gov.uk/media/3537/external-nature-and-scale-of-labour-exploitation-report-final-version-may-2018.pdf

24 Modern Slavery. (2017). A Briefing for the agricultural sector (farming, cereal and livestock). Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/638767/FACTSHEET_Modern_Slavery_Agricultural_v2_WEB.PDF

25 HM Government. (2019). UK Annual Report on Modern Slavery. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/840059/Modern_Slavery_Report_2019.pdf

26 Human Rights Watch. (2019). Nothing Left in the Cupboards: Austerity, Welfare Cuts, and the Right to Food in the UK. Retrieved from https://www.hrw.org/sites/default/files/report_pdf/uk0519_web3.pdf

27 Trussell Trust. (2019). State of Hunger: a study of poverty and food insecurity in the UK. Retrieved from https://www.stateofhunger.org/wp-content/uploads/2019/11/State-of-Hunger-Report-November2019-Digital.pdf?_ga=2.21675838.425386498.1623245222-576865524.1623245222

28 Greater London Authority. (2019). Survey of Londoners: Headline findings. London, United Kingdom: City Intelligence. Retrieved from https://www.london.gov.uk/what-we-do/research-and-analysis/people-and-communities/survey-londoners

29 Social Market Foundation. (2018). What are the barriers to eating healthily in the UK? Retrieved from https://www.smf.co.uk/wp-content/uploads/2018/10/What-are-the-barriers-to-eating-healthy-in-the-UK.pdf

30 Wang, Y., Touboulic, A., & O'Neill, M. (2018). An exploration of solutions for improving access to affordable fresh food with disadvantaged Welsh communities. European Journal of Operational Research, 268(3), 1021-1039. https://doi.org/10.1016/j.ejor.2017.11.065.

31 The Food Foundation. (2021). A Crisis Within a Crisis: The Impact of Covid-19 on Household Food Security. Retrieved from https://foodfoundation.org.uk/wp-content/uploads/2021/03/FF_Impact-of-Covid_FINAL.pdf

32 FAO. (2018). The 10 Elements of Agroecology: Guiding the transition to sustainable food and agricultural systems. Rome, Italy: FAO. Retrieved from http://www.fao.org/documents/card/en/c/I9037EN

33 International Forum for Agroecology. (2015). Declaration of the International Forum for Agroecology. Retrieved from https://www.foodsovereignty.org/wp-content/uploads/2015/02/Download-declaration-Agroecology-Nyeleni-2015.pdf

34 FAO. (2018). The 10 Elements of Agroecology: Guiding the transition to sustainable food and agricultural systems. Rome, Italy: FAO. Retrieved from http://www.fao.org/documents/card/en/c/I9037EN

35 Institute for Sustainable Development and International Relations. (2018). An agroecological Europe in 2050: multifunctional agriculture for healthy eating - Findings from the Ten Years For Agroecology (TYFA) modelling exercise.

Retrieved from https://www.soilassociation.org/media/18074/iddri-study-tyfa.pdf

36 IPCC. (2019). Land Degradation. In Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (pp. 389). Retrieved from https://www.ipcc.ch/site/assets/uploads/sites/4/2019/11/07_Chapter-4.pdf

37 IPBES. (2019). Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (pp. XXII). Bonn, Germany: IPBES Secretariat. Retrieved from https://ipbes.net/system/files/2021-06/2020%20IPBES%20GLOBAL%20REPORT%28FIRST%20PART%29_V3_SINGLE.pdf

38 WWF. (2020). Nature Hires: How Nature-based Solutions can power a green jobs recovery. Retrieved from https://wwfint.awsassets.panda.org/downloads/nature_hires_report_wwf_ilo.pdf

39 Vaarst et al. (2018). Exploring the concept of agroecological food systems in a city-region context, Agroecology and Sustainable Food Systems, 42(6), 686-711. https://doi.org/10.1080/21683565.2017.1365321

40 FAO. (2018). The 10 Elements of Agroecology: Guiding the transition to sustainable food and agricultural systems. Rome, Italy: FAO. Retrieved from http://www.fao.org/documents/card/en/c/I9037EN

41 FoEI, TNI, & Crocevia. (2020). Junk Agroecology: The corporate capture of agroecology for a partial ecological transition without social justice. Retrieved from https://www.tni.org/files/publication-downloads/38_foei_junk_agroecology_full_report_eng_lr_0.pdf

42 LWA. (2020a). Survey of new entrants to agriculture and land based work. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2020/09/New-Entrants-Survey-Summary-of-results.pdf

43 Shrubsole, G. (2019). Who Owns England?: How We Lost Our Green and Pleasant Land, and How to Take It Back. London, UK: William Collins.

44 Savills. (2020). What is Rural Land Worth? Historic average land values in Britain. Retrieved from https://www.savills.co.uk/landing-pages/rural-land-values/rural-land-values.aspx

45 Knight Frank. (2020). Farmland index Q3 2020. Retrieved from https://content.knightfrank.com/research/157/documents/en/english-farmland-index-q3-2020-7487.pdf

46 CPRE. (2019). Reviving County Farms. Retrieved from https://www.cpre.org.uk/wp-content/uploads/2019/12/December-2019_Reviving-county-farms.pdf

47 LWA. (2020a). Survey of new entrants to agriculture and land based work. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2020/09/New-Entrants-Survey-Summary-of-results.pdf

48 Taherzadeh, A. (2019). Learning Pathways into Sustainable Agriculture: the motivations and approaches of young entrant farmers. The Sustainable Places Research Institute, Cardiff University. Retrieved from https://blogs.cardiff.ac.uk/sustainableplaces/wp-content/uploads/sites/420/2020/01/Learning-Pathways-Into-Sustainable-Agriculture-Report.pdf

49 LWA. (2020a). Survey of new entrants to agriculture and land based work. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2020/09/New-Entrants-Survey-Summary-of-results.pdf

50 McCann, D. (2021). Food and Land in the UK: what role can land reform play in reducing inequalities in access to land? People's Land Policy. Retrieved from https://youtu.be/5noMwD6JQfU

51 Laughton, R. (2017). A Matter Of Scale: A study of the productivity, financial viability and multifunctional benefits of small farms (20 ha and less). Landworkers' Alliance and Centre for Agroecology, Coventry University. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2018/10/matterofscale.pdf

52 Calliste, J., Sivapragasam, S., & McDonald, M. (2021). Rootz into Food Growing: Knowledge and experiences of social enterprise food growers from black / communities of colour. Land In Our Names, Black Rootz, OrganicLea, The Ubele Initiative. Retrieved from https://static1.squarespace.com/static/5eece00ee6780d38b9fb012f/t/60ace24b8b87b828f51ec72e/1621942864883/FINAL+Rootz+into+Food+Growing+report+25.05.21.pdf

53 Radwan, L. (2020). Webinar: Race and Farming in the UK. LWA. Retrieved from https://vimeo.com/438509351

54 Jesudason, D. (2020). Rural Racism: A closed door. Retrieved from https://wickedleeks.riverford.co.uk/features/diversity-inequality-farming/rural-racism-closed-door

55 Calliste, J., Sivapragasam, S., & McDonald, M. (2021). Rootz into Food Growing: Knowledge and experiences of social enterprise food growers from black / communities of colour. Land In Our Names, Black Rootz, OrganicLea, The Ubele Initiative. Retrieved from https://static1.squarespace.com/static/5eece00ee6780d38b9fb012f/t/60ace24b8b87b828f51ec72e/1621942864883/INAL+Rootz+into+Food+Growing+report+25.05.21.pdf

56 Trussell Trust. (2019). State of Hunger: a study of poverty and food insecurity in the UK. Retrieved from https://www.stateofhunger.org/wp-content/uploads/2019/11/State-of-Hunger-Report-November2019-Digital.pdf?_ga=2.21675838.425386498.1623245222-576865524.1623245222

57 Driessen, G. (2020a). Building a more resilient food system in Oxfordshire: an analysis of the local response to the COVID-19 crisis. Good Food Oxford. Retrieved from https://goodfoodoxford.org/wp-content/uploads/2020/11/Building-a-more-resilient-food-system-FINAL.pdf

58 LWA. (2020b). Direct Sales and Short Supply Chains. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2020/10/LWA-Direct-Sales-CASE-STUDIES-.pdf

59 Wheeler, A. (2020). Covid-19 Veg Box Report. Food Foundation. Retrieved from https://foodfoundation.org.uk/wp-content/uploads/2020/05/Food-Foundation-COVID-19-Veg-Box-Scheme-report.pdf

60 ibid.

61 Driessen, G. (2020a). Building a more resilient food system in Oxfordshire: an analysis of the local response to the COVID-19 crisis. Good Food Oxford. Retrieved from https://goodfoodoxford.org/wp-content/uploads/2020/11/Building-a-more-resilient-food-system-FINAL.pdf

62 ibid.

63 Wheeler, A. (2020). Covid-19 Veg Box Report. Food Foundation. Retrieved from https://foodfoundation.org.uk/wp-content/uploads/2020/05/Food-Foundation-COVID-19-Veg-Box-Scheme-report.pdf

64 LWA. (2020b). Direct Sales and Short Supply Chains. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2020/10/LWA-Direct-Sales-CASE-STUDIES-.pdf

65 Guzman, P., & Reynolds, C. (2019). Food Hubs in the UK: Where are we and what next? London, UK: Food Research Collaboration. Retrieved from https://foodresearch.org.uk/publications/food-hubs/

66 Michalský, M. & Hooda, P. S. (2015). Greenhouse gas emissions of imported and locally produced fruit and vegetable commodities: A quantitative assessment. Environmental Science & Policy, 48, 32-43. https://doi.org/10.1016/j.envsci.2014.12.018

67 Kriewald, S. et al. (2019). Hungry cities: how local food self-sufficiency relates to climate change, diets, and urbanisation. Environmental Research Letters 14(9) https://doi.org/10.1088/1748-9326/ab2d56

68 IPCC. (2019). Food Security. In IPCC, Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (pp. 437-550). Retrieved from https://www.ipcc.ch/site/assets/uploads/sites/4/2021/02/08_Chapter-5_3.pdf

69 Jaccarini, C., Lupton-Paez, M. & Phagoora, J. (2020) Farmer-Focused Routes to Market: An evaluation of the social, environmental, and economic contributions of Growing Communities. London, UK: New Economics Foundation. Retrieved from https://www.nefconsulting.com/wp-content/uploads/2021/04/Farmer-focused-routes-to-markets-an-evaluation-of-growing-communities-April-2021.pdf

70 ibid.

71 Driessen, G. (2020b). Improving access to land for food production in Oxfordshire: what are the possibilities and where do we go from here? Good Food Oxford. Retrieved from https://goodfoodoxford.org/wp-content/uploads/2020/11/Improving-access-to-land-for-food-production-FINAL.pdf

72 LWA. (2018). How to Set Up a Farmstart: A handbook for establishing and running an incubator farm site. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2018/10/Farm-Start.pdf

73 OrganicLea (2021) Current Course Opportunities. Retrieved from https://www.organiclea.org.uk/we-help-you-grow-your-own/training-2/training/

74 LWA. (2018). How to Set Up a Farmstart: A handbook for establishing and running an incubator farm site. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2018/10/Farm-Start.pdf

75 LWA. (2020a). Survey of new entrants to agriculture and land based work. Retrieved from https://landworkersalliance.org.uk/wp-content/uploads/2020/09/New-Entrants-Survey-Summary-of-results.pdf

76 Calliste, J., Sivapragasam, S., & McDonald, M. (2021). Rootz into Food Growing: Knowledge and experiences of social enterprise food growers from black / communities of colour. Land In Our Names, Black Rootz, OrganicLea, The Ubele Initiative. Retrieved from https://static1.squarespace.com/static/5eece00ee6780d38b9fb012f/t/60ace24b8b87b828f51ec72e/1621942864883/FINAL+Rootz+into+Food+Growing+report+25.05.21.pdf

77 Driessen, G. (2020a). Building a more resilient food system in Oxfordshire: an analysis of the local response to the COVID-19 crisis. Good Food Oxford. Retrieved from https://goodfoodoxford.org/wp-content/uploads/2020/11/Building-a-more-resilient-food-system-FINAL.pdf

78 Granville Community Kitchen (2020) Good Food Box. Retrieved from https://granvillecommunitykitchen.org.uk/good-food-box/

79 Driessen, G. (2020a). Building a more resilient food system in Oxfordshire: an analysis of the local response to the COVID-19 crisis. Good Food Oxford. Retrieved from https://goodfoodoxford.org/wp-content/uploads/2020/11/Building-a-more-resilient-food-system-FINAL.pdf

The Food Research Collaboration is an initiative of the Centre for Food Policy, facilitating joint working between academics and civil society organisations to improve the UK food system, and making academic knowledge available wherever it may be useful.

We are grateful to the Esmée Fairbairn Foundation for funding our work.

Food Research Collaboration

an initiative of

Centre for Food Policy

Shaping an effective food system

ISBN: 978-1-903957-59-2

Driessen, B. 2021. *Sustainable Food Hubs: A route to just food from agroecological food systems.* Food Research Collaboration Discussion Paper.

Esmée Fairbairn FOUNDATION