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Essential elements of self-organization illustrated through localized agri-food systems

Emma Burnett 

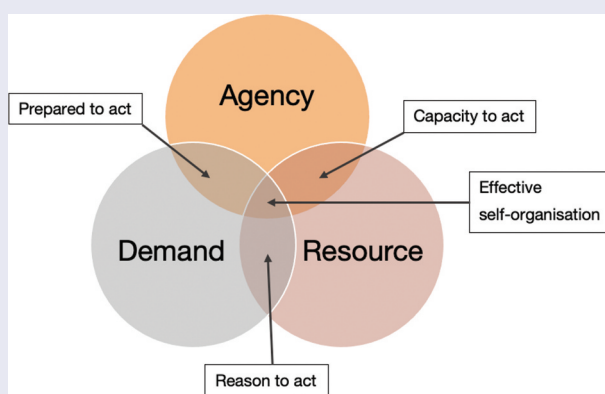
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ABSTRACT

Self-organization is prevalent in local agri-food systems (LAFS), which must often adapt rapidly to both internal and external pressures. This was evident during the COVID-19 pandemic, which required rapid self-organization in LAFS due to increased demand for smaller-scale and localized food producers and distributors. Previous research has explored drivers of self-organization in LAFS, often as an artifact of slow-boil socio-economic or environmental crises. However, there is less research investigating the ingredients required for self-organization to successfully materialize. This paper argues that there is a gap in both the literature and practice that overlooks three core elements required for effective self-organization, or ideas that can transition from thought into action. These fundamental elements – agency, demand, and resource – must all be present and work in harmony for effective self-organization to occur and must be understood as a package. From evidence collected through “patchwork ethnographic” research in Oxford, UK and Freiburg, Germany this paper details how these elements impact decisions and actions taken by LAFS actors. Understanding these core elements can have practical ramifications for practitioners, facilitating better understanding of why ideas or actions may be (in)effective and how to foster effective self-organization, as well as highlighting avenues for self-organization research.

KEYWORDS

Self-organization; local agri-food systems; patchwork ethnography; local food systems



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Introduction

Self-organization is prevalent in local agri-food systems (LAFS), which must often adapt rapidly to both internal and external pressures. Previous research has explored drivers of self-organization in LAFS, often as an artifact of slow-boil socioeconomic or environmental crises in Western, educated, industrialized, rich, democratic (WEIRD) countries (Henrich, Heine, and Norenzayan 2010), e.g. due to economic policies, like the UK's austerity measures; or the effects of the COVID-19 pandemic on supply chains (Blake 2019; Garnett, Doherty, and Heron 2020). Previous research has also explored the role of self-organization in filling social need or as a component of creating new enterprise or social connections (Morrow 2019a; Saxena 2020).

There has been less work done exploring the factors required for self-organization to successfully materialize. This paper argues that there are three fundamental elements – agency, demand, and resource – which must all be present for effective self-organization to occur. As such, they must be understood as a package. While some researchers have explored one, or sometimes two, of these elements, some in great depth (for example, Anzola, Barbrook-Johnson, and Cano 2017; Denters 2016; Uitermark 2015), none have yet drawn all three together. This paper argues that there is a gap both in the literature and in practice which overlooks the need for all three elements to work in harmony to make self-organization possible.

LAFS engage extensively in self-organization, or the process through which agents engage in collective action, problem solving, and consensus building (Blake 2019; Morrow 2019a; Saxena 2020). Activities can be understood as self-organizing when they are in response to stress or crisis (Wheatley and Kellner-Rogers 1996); as they evolve from one form to another (Loh and Agyeman 2019; Maughan and Ferrando 2018; Morrow 2019a; Sherwood, van Bommel, and Paredes 2016; Vivero-Pol 2017); and in daily activities where actors direct everyday action (Pottinger 2017; Tapsell and Woods 2010).

Though self-organization occurs in everyday decision-making, as well as in crisis, the COVID-19 pandemic provided an opportunity to study both *in situ*, as it were, due to the speed of change in the food supply chains and spikes in demand for smaller-scale and localized food producers and distributors (Blay-Palmer et al. 2021; Cruz et al. 2021; Davis 2020; Garnett, Doherty, and Heron 2020; iPES Food 2020). Systemic shocks, like the COVID-19 pandemic, highlight the need for a plurality of scales in food systems. Though large-scale international trade persisted during iterative lockdowns, mid-level food systems and localized supply and distribution were critical to many households (Blay-Palmer et al. 2021; Clapp and Moseley 2020). In European countries, interest and activity in localized agri-food systems increased tangibly over the course of the pandemic (Davis 2020; Enthoven and Van den Broeck 2021).

Panic buying, increased demand for deliveries, a desire to eat healthier, increased time at home, and increased interest in outdoor markets during COVID-19 lockdowns all contributed to escalated awareness of LAFS, and drove demand for local goods (Davis 2020; Driessen 2020). As demand for local food and services increased, LAFS found themselves under increasing pressure to deliver at orders of magnitude previously unimagined. For some enterprises or organizations, this meant an escalation in production, sourcing, delivery, and staffing. For others, it meant repointing efforts or launching entirely new enterprises. For all, it meant an increase in the rate of self-organization.

This raises a key question around self-organization, namely what factors are required for self-organization to successfully materialize, or create the environment in which an idea can be operationalised? Understanding the elements that make self-organization possible is critical to LAFS, which rely heavily on self-organization to function. To explore the factors for self-organization in LAFS, this paper uses data collected through comparative case studies on LAFS from Oxford, UK and Freiburg, Germany, which give a multi-stakeholder, multi-location perspective that elicits a greater understanding of the critical elements of self-organization.

Section two delves into the background of LAFS. Section three explores some ways that self-organization has been explored and expanded within social science research, outlines concerns and criticisms of the concept, and highlights gaps in understanding of self-organization and how this impacts LAFS. Section four discusses the research methodology. Section five breaks down the three elements of self-organization, evidenced through the case studies, and provides vignettes that explore the ideas as a complete package. Finally, the summary stresses how important understanding these elements is for effective self-organization, which is critical to the operations of many LAFS.

Local agri-food systems in practice and the literature

The COVID-19 pandemic drove increased interest and activity in LAFS in European countries (Davis 2020; Enthoven and Van den Broeck 2021). Demand for local goods, accessible outdoor markets and volunteering spaces, a desire to eat healthier food, and easier access when supermarkets were unable to meet demand all contributed to this increased appetite for “local” products and suppliers (Davis 2020; Driessen 2020). LAFS were pivotal in meeting this increased demand. Before the pandemic, LAFS were already gaining traction in research and practice as potential ground for improved food security (Sellberg et al. 2020), reduced environmental impact (Ghosh 2014; Mantino and Vanni 2018), improved nutrition (Costello et al. 2021), and

improved transparency and democracy (Hedberg and Zimmerer 2020; Windfuhr and Jonsén 2005).

There is currently no universally accepted definition of LAFS, which may, for some, be the appeal of the term. As Kneafsey et al. (2013) point out, there is a wide range of terminology that has been used to describe non-industrialized agri-food systems across academic literature, as well as in policy, commerce, and civic debate. These terms attempt to describe and illustrate production, distribution, and re-localization of agriculture and food culture. They include, but are not limited to: *terroir*, local food, agroecology, short food supply chains, values-based supply chains, alternative food networks, and territorial food systems. These concepts are interconnected, as well as, on occasion, confusing. For example, LAFS may sit within, e.g. a broader agroecological network, which integrates “research, education, action and change that brings sustainability to all parts of the food system: ecological, economic, and social” (Gliessman 2018). Alternatively, an agroecological farm may be a participant within a wider LAFS which doesn’t necessarily strive to meet agroecological ideals.

LAFS coast on a wave of non-specificity, problematic in academia but often of lesser concern in policy and commerce. “Local” is relative to context, and may be based on spatial proximity, i.e., political boundaries or some other defined geographical boundary; on relational proximity, or the relationships and networks that LAFS actors develop; or on values proximity, i.e. transparency, governance, origin, freshness, ethics, quality, cultural relevance (Blake, Mellor, and Crane 2010; Enthoven and Van den Broeck 2021; Kneafsey et al. 2013). The lack of specificity around LAFS allows practitioners to imagine whatever form appeals most to their view of food, culture, and economy. However, this imprecision can also allow practitioners to utilize “local food” in whatever way is apposite for them, including by large market actors, who have appropriated it as a marketing tool (Tregear 2011). For the purposes of this paper, LAFS are conceptualized as non-industrialized, smaller-scale food systems in which practitioners, products, markets, stakeholders, resources, and landscapes are related through participants’ sharing of some, if not all, ethics, experiences, values, and aspirations.

Self-organization in the literature and LAFS

Self-organization research stems from complexity theory and complex adaptive systems, describing chemical and physical interactions, which were later applied to economics and computing (Ashby 1947; Axelrod 1997; Fuchs 2003; Schelling 1971). These concepts began migrating, first from physical to biological systems, then into social domains (Anzola, Barbrook-Johnson, and Cano 2017; Uitermark 2015).

In relation to human behavior, self-organization is a process through which agents may become active in collective action, problem solving, and consensus building. It is an iterative process that can happen at any decision-making moment, and a mechanism through which change can occur at any level or scale, e.g. at a single-person scale, within organizations, between organizations. Self-organization may (but doesn't necessarily have to) lead to socio-institutional changes in practice (Hasanov and Zuidema 2018).

The classic example of self-organization is that of a chaotic event – shortly after a natural disaster, people spontaneously organize to help, often ahead of national or international aid (Wheatley and Kellner-Rogers 1996). This rapid response to random events is an example of order emerging from chaos, and shines a light on behavior during uncertainty. However, not all chaos is as destructive as natural (or manmade) disasters. Self-organization also happens in daily decision-making.

Self-organization can be a powerful process, but in both research and practise it is vital to recognize potential problems to avoid making or reinforcing historical mistakes. These pitfalls are particularly relevant to LAFS, as they can reinforce some of the environmental and social injustice that LAFS already struggle with (Born and Purcell 2006). From a lay perspective, self-organization seems an understandable, accessible, compelling, and often positive concept. However, it can be limiting or damaging when enacted (Anderson et al. 2014; Denters 2016; Uitermark 2015), and its technical origins have lent (often un-earned) legitimacy when applied to real-world social and political situations (Adger 2006; Raworth 2017).

Particularly relevant is the widespread appeal of self-organization to those advocating rolling back national welfare and state support (Uitermark 2015). Self-organized community initiatives often appear in place of state support. For example, social support networks have appeared in the UK following austerity cutbacks, which reinforced further cutbacks because the communities provided evidence that they will, in fact, step in (Denters 2016). Hastily glorifying self-organization at community level can unintentionally assist governments that declare themselves incapable of supporting citizens directly and devolving action and responsibility to localized communities (Uitermark 2015). This, in turn, can lead to exploitation via self-organization, which leave communities underserved or patchily serviced, and can mask or obstruct initiatives in stigmatized groups (McClintock 2014; Sonnino and Griggs-Trevarthen 2013; Uitermark 2015). However, it is worth recognizing long-lived community-led initiatives – churches providing poverty relief in Europe since the Middle Ages; unions developed during the industrial revolution; and numerous revolutions aimed at creating more democratic political structures, many of which filtered up and are visible in 20th century European states (Denters 2016).

Constant engagement by actors in self-organization can be draining. Endless task switching (Sokka et al. 2017), concerns over funding and job security (Jacob and Rocha 2021), and navigating unclear roles or agendas (Uitermark 2015) can lead to staff and volunteer burnout. There is a remarkably high turnover in LAFS staff, which can lead to knowledge loss and reputational damage, as well as stymying the development of important relationships needed to build partnerships between actors.

Successful self-organization requires strong “institutional tissue” to grow and thrive (Denters 2016; Uitermark 2015). This necessitates robust, preexisting networks, along with access to human and financial capital in order to coordinate activities, shoulder responsibility, and think in the long-term. A lack of robust networks can lead to unevenly distributed self-organization, where action takes place but can be exclusionary or unsuccessful, already a noted problem within LAFS (Denters 2016; Mendiwelo-Bendek and Raul Espejo 2015; Ostrom 1995; Uitermark 2015). Sink-or-swim models of funding are often problematic (i.e., one-to-two years of funding), especially in low-income areas or for initiatives not intended to turn income such as food banks or education. Self-organized responses to withdrawals in state support are especially reliant on start-up funding, support from officials, permits, physical spaces, and ongoing cooperation with local government (Denters 2016). Without long-term, guaranteed support, organizations often turn to more profitable uses of space or human resources to drive revenue, which cannibalize time and resources. This distracts actors from focusing on stated aims, community access, and possibly organizational lifespan. This can be seen, for example, in community gardens which transition from rent-free to rent-paying, impacting decision-making, accessibility, and land use (Schmelzkopf 1995).

The transition of self-organization research from “hard science” to “social science” has been peppered with technical, disciplinary, organizational, and theoretical barriers (Anzola, Barbrook-Johnson, and Cano 2017). Although self-organization comes with some serious drawbacks, self-organization is not avoidable, nor should it be avoided. In the light of disruptions like the COVID-19 pandemic, turbulence due to political unrest, and continuing climate change events, the time is ripe for social disciplines to fully engage with self-organization, and to better understand not just what self-organization is, but how to ensure efficacy and parity. This is particularly true for LAFS, where self-organization is enacted at all scales, and, especially rapidly during times of crisis – as was seen during the COVID-19 pandemic (Anderson et al. 2014; Blake 2019; Hasanov, Zuidema, and Horlings 2019; Morrow 2019a; Saxena 2020).

Critical elements of self-organization

This paper argues that the concepts of agency, demand, and resource are critical to the manifestation of self-organization. Whilst each of these concepts

has a wealth of research underpinning it, both within self-organization research and in wider social science scholarship, they have not yet been drawn together in studies concerned with self-organization specifically in LAFS.

Agency can be understood as the capacity of actors to make and enact decisions (Berkes and Ross 2013; Fuchs 2003; Sherwood, van Bommel, and Paredes 2016; Vivero-Pol 2017). These are shaped by the “motivations, beliefs and values of individual agents steering or influencing the transition pathways ... [and] it is the agency of actors that drives transitions” (Vivero-Pol 2017, 5). Agency is a particularly important feature for LAFS, which operate within rapidly changing landscapes of people and drivers (Soubry et al. 2020). Morrow (2019b) notes that actors in Berlin’s food sharing community felt empowered to “co-create the resources they benefit from” (p.202) through discussions, network building, and reciprocity, including understanding perceived risks, engaging with authorities, and managing governance structures. A lack of agency can disproportionately affect marginalized actors or communities, as well as those new to the field or not personally invested in the process or outcomes (Anderson and Maughan 2021). Agency does not happen in a vacuum, but must be nurtured through social learning and capacity building (Berkes and Ross 2013).

Demand is the element of self-organization that appears most frequently across the literature, though more often implied than explicitly stated. Demand is the clear necessity that drives actors to engage in action (Denters 2016; Ismael 2011; Luhmann 1995). This may be due to crises, or down to simpler, more everyday needs. Though reasons for demand may vary, it is a gap or an absence of something, not unlike an unfilled ecological niche. Case studies highlight demand-driven self-organization. Loh and Agyeman (2019) examine Boston’s food solidarity economy, where the community has “created shared growing spaces, developed shared facilities for food businesses, opened a community cafe, and launched a worker owned composting cooperative ... They are driven by desires for transformation – from the current exploitative, extractive, and structurally unequal food system to a more just, sustainable, and democratic local food economy” (p.213). Morrow (2019b) similarly explores food sharing in Berlin through public fridges, a form of food commons that are “valued by food-sharers for their accessibility and potential to politicize food waste while de-stigmatizing free food” (p.205), and driven entirely by the demand of participants. Pressure from staff, volunteers, customers, voters, etc. can also be conceptualized as demand, influencing decision-making and action. This could include, but is certainly not limited to, demands for reduced plastic usage, organic production methods, increases in spending, or requests for more staff or volunteers.

Resource or capacity – time, money, energy, existing relationships, institutional or public support, physical space – have often been linked to the

actuation of self-organization. These are limiting or enabling factors, many of which build on each other. As previously mentioned, finance is critical to ensuring success, ideally longer-term funding which helps in securing essentials like rent, staff, and land contracts (Ostrom 2010; Soubry et al. 2020). Time has also been noted as being particularly important, with self-organization requiring “immense effort from dozens or even hundreds of people volunteering their time and coordinating their activities” (Uitermark 2015, 2306). LAFS are notable for their reliance on volunteers and donated time from staff, many of whom work to capacity (Santo et al. 2021). This reliance on donated time can leave LAFS unevenly spatially distributed, as initiatives rely on those who have time to give (Blake 2019). Resource also plays a fundamental role in evolution, innovation, and experimentation within LAFS (Barthel, Parker, and Ernstson 2015; Camps-Calvet et al. 2015; Hoey and Sponseller 2018). Without system slack or flexibility, time, money, collective memory, and staffing, the capacity to self-organize is compromised.

While all three elements have been variously discussed in the self-organization and LAFS literature, they have not yet been drawn together. In doing so, this research highlights how important it is that they be understood as elements that must all be present for self-organization to manifest, and particularly important for LAFS, which rely heavily on self-organization. This paper argues that this is a gap in both the literature and in practice, that in order to have effective self-organization, i.e. ideas that transition from thought or discussion into action, all three must work in harmony and be understood as a package.

Methods

This study uses a comparative studies approach in a “patchwork ethnography.” It was based on 13 LAFS case studies in organizations in Oxford, UK ($n = 7$) and Freiburg in Breisgau, Germany ($n = 6$) between 2018–2022. Patchwork ethnography is an innovative addition to social science research, encouraging inclusivity through “ethnographic processes and protocols designed around short-term field visits, using fragmentary yet rigorous data, and other innovations that resist the fixity, holism, and certainty demanded in the publication process” (Günel, Varma, and Watanabe 2020). Spanning the COVID-19 pandemic, this research would not have been possible without patchwork ethnography’s flexible and inclusive approach to research, allowing, as it does, a plurality of “fragmentary yet rigorous data” (ibid) which is attentive to the demands placed particularly on researchers who are: women, LGBTQ+, people of color, and/or managing a disability.

Patchwork ethnography proved particularly effective for data collection during the COVID-19 restrictions, offering contextual richness through a diversity of research instruments. This included “patching” together research

visits in both the UK (long-term) and Germany (short-term), online and in-person semi-structured interviews, ethnographic field notes, participant observation, volunteer ethnography, e-mails, meeting and event notes, document collection including webpages and social media posts, and annual and research reports. This research overlapped with the author being embedded within LAFS organizations, volunteering and working with multiple organizations in Oxford between 2018–2022, which offered deep insight into everyday practices before, during, and after the pandemic. This practical experience in Oxford helped with relationship building with similar organizations in Freiburg, legitimizing the author in the eyes of Freiburg’s LAFS actors. Taking a patchwork ethnography approach helped to provide rich data that were relevant to the research in the absence of a long research stay in Germany.

Case selection

The comparative nature of this work explores whether, under the same line of enquiry, similar LAFS in different European cities experience the same or different self-organizing principles. Comparative research is used to understand and explore commonalities and differences between countries or cultures (Eriksen 2017; Pennings, Keman, and Kleinnijenhuis 2006; Yin 2009). Comparative research is a powerful way to better understand cultural contexts (Eriksen 2017); identify and analyze path dependent functions based on historical legacies (e.g. racial tensions, models of land ownership) (Mahoney 2000; Pierson 2000); examine rationalities around decision making (Dhami 2017; Tversky and Kahneman 1986); and better understand variability of individuals, organizations, or governments (Feagin, Orum, and Sjoberg 2016; Sasaki 2004). The comparative approach taken in this research helped to avoid assumptions that single locations are representative of all (Nasif et al. 1991), and allowed the in-depth exploration of lived experience rather than depending solely on quantitative data (which often details *what* happens, but often not *why*) (Pennings, Keman, and Kleinnijenhuis 2006). The cases in the two locations revealed that the three conditions – agency, demand, and resource – are crucial to self-organization, and the comparisons reinforce the point.

The cases chosen were “illustrative of the heterogeneity of modes of food production – consumption encountered” (Holloway et al. 2007, 7) which, each in their own ways, have aimed to challenge the mainstream food system economically, socially, or culturally (Holt-Giménez and Shattuck 2011; Loh and Agyeman 2019; McClintock 2014). As much as possible, cases were selected that filled a range of niches, including primary production, community gardens, community supported agriculture, food hubs, food aid organizations, food research organizations, and food policy councils (Table 1). They

Table 1. Organizations represented in the research, showing a multi-stakeholder perspective.

Oxford, UK	Freiburg im Breisgau, Germany ¹
OX1: Food hub, distributing local produce, dry goods, and household essentials to customers	FB1: Community supported agriculture scheme distributing own-grown produce to members
OX2: Food policy organisation and community food network	FB2: Food policy council and food discussion forum
OX3: Small, organic fruit and vegetable farm	FB3: Small, organic wine farm and distillery
OX4: Urban community farm, producing fruit, veg, eggs; open to the public	FB4: Urban community garden producing fruit and veg; open to the public, hosts events
OX5: Small organic dairy farm; organisation no longer extant	FB5: medium-scale middleman focusing on preparation and sales of fruit and vegetables; employs people with disabilities
OX6: Food surplus redistributor; employs vulnerable youth	FB6: citizen shareholder organisation financing sustainable food and farming practices
OX7: Community support organisation distributing food aid and support to at-risk residents	

were also selected based on a mix of theoretical (their roles and engagement within LAFS) and practical (their capacity to host a researcher or do interviews) considerations. Each organization has its own agenda, but also works with others as part of a broader LAFS, and has (to varying degrees) experience of self-organization.

In practice, LAFS have been extremely popular in both the UK and Germany. However, while research has been prolific in the UK (e.g. “alternative food,” “local food,” “values-based supply chains,” or “food sovereignty”), Germany’s initiatives appear under-represented in English-language literature. Those that have been researched are often located in Berlin, leaving the rest of the country somewhat neglected. Food studies often focus on large cities, overlooking the experience of small and medium cities. Both the UK and Germany have an abundance of small- and medium-sized cities, each of which has its own food cultures, agricultural histories, and food enterprises and organizations.

On paper, many features of Oxford and Freiburg are very similar. They are both medium-sized, affluent university towns, with long-standing agricultural ties to the surrounding areas. Though both cities have above-median income, they struggle with affordability issues for lower-income residents. Although the cities diverge in a range of ways (e.g. mainstream economic underpinnings, political influences, food norms, and agricultural histories), LAFS are prevalent in both cities and their surrounding regions.

Freiburg is known in Germany as a “green” city, attracting, in particular, environmentally-minded people and “green” innovators. Incomers bring energy and ideas, and tend toward remaining in the region. This has led to LAFS that have more long-term actors, and exist at various scales, from the micro to the meso, filling a range of niches. Oxford, meanwhile, is a more transient city, with people often staying for short tenures as students or researchers at one of the universities before leaving again. Although short-stay residents bring energy to LAFS, they require investment to recruit and train, and innovative ideas often leave with them. The LAFS in Freiburg and Oxford are both ordinary and

extraordinary, and the cases highlight the everyday practices and rationalities of self-organization in action.

Experiences of LAFS during COVID-19 were shared by actors in both locations, with both experiencing spikes in demand for local or regional food and for food aid due to price increases, shielding, or quarantine. There were also increases in volunteers due to furlough schemes, though fewer in Germany which leveraged its flexibility in manufacturing to deploy workers in innovative ways, thus reducing the need to stay home (Hancké, Overbeke, and Voss 2021). There was new energy and interest in LAFS in both locations, seen in large numbers of attendees in public online events around food and agriculture, increases in veg box subscriptions and open-air market customers (Davis 2020), news reporting around food (Busby 2020; Kaschel 2020), and local council and national government support (Good Food Oxford 2021; Langer 2021).

Analysis

Data were analyzed using a combination of inductive and deductive coding using NVivo. The process took a systematic approach, based loosely on Grounded Theory, and tempered by the reality of the COVID-19 situation. Due to restrictions on travel and access, data was collected and analyzed when possible. Emergent themes and codes were analyzed toward the end of the process rather than *in situ*. This still gave an opportunity to add new codes and revisit previous ideas and themes.

The process began with a few predetermined themes (e.g., “self-organization”), with the bulk of the codes emerging from the data, including observational field notes, conversations with LAFS actors, and written documents. The stages of coding were:

- Open coding: examining, comparing, conceptualizing, and categorizing data into “concepts” or “categories;”
- Axial coding: re-assembling data into groups based on identified relationships and patterns within and between categories;
- Selective coding: identifying and describing central phenomena or “core categories” from the data (Corbin and Strauss 2015; Vollstedt and Rezat 2019; Wetherell, Taylor, and Yates 2001).

At each phase, themes were evaluated and allowed to evolve based on previous iterations or newly included data.

Critical elements of self-organization

The following sections explore how and why agency, demand, and resource are critical elements of self-organization, as observed through LAFS in the UK

and Germany. Self-organization has been gaining recognition as an important feature within LAFS (Blake 2019; Hasanov, Zuidema, and Horlings 2019; Morrow 2019a; Saxena 2020).

Throughout the research it became apparent that not all self-organization, whatever the driver, was successful. Rather, successful self-organization relied on three critical elements, with the data illuminating their roughly equal importance and the need for them to work in harmony.

LAFS in both Oxford and Freiburg relied on self-organization both internally (within organization) and externally (between organizations or across a network). Rather than identifying significant differences between cases and locations, it became apparent that all three elements were required regardless of location for effective self-organization.

Agency

Across interviews and fieldnotes in both the UK and Germany, agency appeared as a common theme. Agency is perhaps the most difficult of the three elements to explore and ensure, as the beliefs, motivations, and values of individuals vary from person to person, as does personal resource, resilience, and experience (Vivero-Pol 2017). A sense of agency could improve participant involvement and ownership; a lack of agency was a barrier to action. One interviewee described the importance of agency for both volunteers and non-employees on a community farm:

That's an important point, isn't it. So, sort of being clear about the difference between someone who doesn't act because they don't really want to act, or somebody who doesn't act because they can't, they don't feel, like, a power or agency to conceptualise that. (P1, OX4)

In this example, they pinpoint actors' decisions, and whether they feel capable and equipped to enact them (also see Berkes and Ross 2013; Fuchs 2003; Sherwood, van Bommel, and Paredes 2016; Vivero-Pol 2017). A lack of agency was notable in organizations that recruited high numbers of volunteers during the pandemic, often as an added resource in a time of high demand. However, short-term volunteers, or those who lacked knowledge or skills (or felt that they lacked them), often felt incapable of taking independent action and required high levels of hands-on management from staff. Compounding that, the fast pace of change demanded rapid response from staff and volunteers, and those lacking agency were often not nurtured or empowered to take independent decisions, but rather left on the side-lines with limited guidance or support. In some cases, agency for new staff or volunteers was improved or encouraged through training, performative politics where staff members and existing volunteers led by example, clear job descriptions, and clear policies. For others, it was something staff or volunteers brought with them to the LAFS – a less tangible asset that was perhaps driven by age, confidence, privilege, or reduced risk aversion.

In the case of volunteers, a need for high levels of input can lead to a drain on staff resources (time, energy), whereas adequate agency encourages self-motivated action and can improve overall resource. The ideal situation for LAFS is one in which an employee or volunteer is able to act independently and productively, engaging in work that needs doing without regular guidance or monitoring (or, in some cases, is able to acknowledge that they are not currently required and take a break):

I didn't know what else to do, so I did what looked like needed doing. (

P1, OX3)

This gives a glimpse into how a farm hand was able to act independently, to take an independent decision and follow it through. She had finished digging up leeks for transplanting and trimming the roots, and was waiting for the head farmer to return from the field. While she waited, she had wandered into one of the polytunnels and begun weeding a recently-planted carrot bed, a never-ending job on a small farm. The farm hand added value to the farm while reducing pressure on her colleagues. Specifically, she felt confident in her own abilities, and was proud of her ability to contribute to the working of the farm.

Conversely, agency could be stripped away from actors in decision-making positions. In several cases, there were power imbalances in internal structures or individuals who occupied multiple contradictory roles which impacted agency and disempowered actors from engaging.

[Her] position on the board throws a spanner into the flat hierarchy by introducing financial power. This is obvious in comments like "I need to bring this to the [other organisation's] board." It implies that if she doesn't get what she wants or doesn't like what she sees, she might not bat for us, and we lose funding. (P1, OX1)

An internal power imbalance left multiple staff members with an underlying sense of impotence, as their input was constantly disregarded, and eventually contributed to the departure of a number of staff members who felt they could better contribute their energy and time to other organizations with clearer organizational structures.

Staff and volunteers felt emotionally and reputationally damaged when their input was constantly overlooked, or that it was a waste of time to suggest actions or interventions that were unlikely to be accepted by a gatekeeper, which they felt was a form of ghosting. This led to a loss of staff and volunteers, which is a loss for LAFS, which rely on a wide range of people and ideas to respond rapidly to shifting landscapes and on institutional memory that resides in people more often than on paper.

He always incorporates our knowledge and our opinions. (P1, FB6)

Across the cases, it was clear that agency could be reinforced or eroded by colleagues' support. The role of support in a hierarchy was important to

building agency, as was the clear value given to staff and volunteers. Staff and volunteers felt able to voice opinions and make suggestions, as they knew they would be heard.

Demand

Across the self-organization and LAFS literature, demand appears frequently, both explicitly and implicitly (Carbone 2018; Wang 2020; Wiese 2020). It was also apparent from the data collected that demand plays a central role in self-organization, appearing frequently in field notes and interviews, and that self-organization wouldn't exist without demand, as it acts as a preliminary driver. A natural disaster drives relief action. Retirement drives hiring. The pandemic drove demand for locally produced and distributed food (Davis 2020; Driessen 2020; Faucher et al. 2020). Box schemes, community supported agriculture, larders, food banks, and online marketplaces in the UK and Germany all saw sharp increases in usage.

It is clear that demand will increase numbers, which have already gone from mid 30s to nearly 200 [between March and April 2020]. (Field notes)

Increasing demand due to the pandemic meant that small and medium food organizations had to make numerous, rapid decisions. These ranged widely, and included creating new delivery routes, onboarding more volunteers, managing health and safety concerns, sourcing through new supply chains, and integrating into new and existing local food networks. Demand for local and regional food drove self-organization both within LAFS organizations and between them.

Crisis is not the only form of demand that can be pinpointed, however. Quiet demand can be identified, as well, or the demand for a food landscape not driven by crisis or emergency, but from a desire to realize a different agri-food ecosystem (Jehlička, Daněk, and Vávra 2018). For example, one action group in Freiburg comprised of students, farmers, and other food practitioners has:

... good links into, e.g. the student canteen (Mensa), where they have the ear of the catering manager. Also, because of the large scale of production and resource here ... they can fill demand as they themselves create it. (Field notes)

A circular demand was consciously being developed, with participants encouraging those with institutional purchasing power to utilize the resources available through the LAFS (simultaneously, an illustration of agency). An existing regional food middleman made access to primary produce possible, re-localizing supply chains by purchasing directly from regional farms.

Demand at a customer/citizen level can also drive self-organization. Following "lively discussions, with a lot of enthusiasm and interest on the part of the citizens, ... the phrase 'nutrition council' was heard again and again

at the [Agrukultur]festival” and led to the founding of the Ernährungsrat, or nutrition council, in Freiburg (Stadtkurier 2018). The demand for a centralized hub for regional food discussions around policy and implementation led a core group to found a new organization to fill this demand, obtaining funding, staff, and developing an organizational structure. A new project, House of Food, has subsequently branched off from the Ernährungsrat, driven by a vision of transformation – promoting agricultural knowledge exchange, regional food structures, and nutrition education (Böddeker, Costa, and Koch 2021). Though demand may seem an extremely basic element, it is critical to self-organization. Without demand, nothing would happen because nothing would need to happen.

Resource

Resource plays a critical role in self-organization. The availability of time, money, energy, staff and volunteers, existing relationships, institutional or public support, and physical space impact the ability of actors to act, even when there is clear demand and adequate agency.

Across the cases, time was a particular constraint. This was noted in earlier work from Denters (2016) and Uitermark (2015), and reinforced in the field notes and interviews. Within LAFS, reliance on volunteers for extra labor is common, and long-term, reliable volunteers are highly sought after. This is evidenced in comments like:

What we really need is a team of knowledgeable people each week who understand the systems and just get on with it. People who don't need much managing. (Field notes)

This heavy reliance on volunteers is a risk, as poor reliability or high management can be a drain on employees, rather than adding to the resource pot. This was particularly true during COVID-19 lockdowns, when surges in volunteers meant that LAFS were managing high volumes of untrained volunteers, and often losing them again when lockdowns ended or when employers found workarounds to furlough.

Additionally, there is high reliance on very few staff in most LAFS organizations, which leave them vulnerable to the loss of institutional memory during staff turnover:

As I come to the end of my tenure with [OX1], it's clear how much they've come to rely on me – not as an employee, but as a prop. (Field notes)

A tendency toward extractivist practices means that there is generally limited time or energy to develop good handover notes or staff training. OX1 lost numerous staff members over the course of the pandemic, and the loss left newcomers lacking certain core essentials, including depth of organizational background knowledge or integration into LAFS networks.

There was also a notable lack of system flexibility, or slack, which can lead to a lack of creativity, disgruntled staff, and eventually burnout (Probst et al. 2007; Sokka et al. 2017). Participants from OX2 illustrated this point in a meeting, where a staff member pushed back against what they felt was an unfair allocation of their time and resources:

P1: I can't take on any more work.

P2: this is network, so within your remit. I'm trying to manage your capacity – if you can't take on any more, I need to be involved.

P1: I feel like I didn't sign up for this project, and it's suddenly my responsibility.

(P1 & P2, OX2)

Another example, from an employee at OX1, indicates how overwork has left them unable to contribute to creative solutions:

Look, I have got no more thinking capacity left in me anymore. (P2, OX1)

The staff member had been working extremely long days, and there had been rapid organizational change, which left her feeling tired. That exhaustion meant that when faced with a new problem, they were unable to engage with it. In this case, a customer had queried the value of the fruit and veg they were receiving, and another staff member suggested comparing the box contents to supermarket prices. However sensible the suggestion, P1 felt it was one job too many, and couldn't face doing the extra work.

Capital resources, including land, finances, physical space, vehicles, etc. were also raised as issues by interviewees in both locations, especially in relation to creative responses to problems. This wasn't related only to the COVID-19 crisis, but the need for resources was accelerated.

Financially supporting people in actions that are trying to make the change or build structures is one thing they can easily do . . . And I think it's really important to have new motivated people with lots of energy. (P1, FB2)

Access to stable and easy-to-access funding, either through trade, subsidy, or funding bodies, can make the difference between LAFS onboarding people with the skills and energy to commit to ideas, or not.

We need more than just different sources of money coming in, so that we [are] not depending on one point, and now what it is [funding the project] is the city. If this is not happening, then we are having really a problem. (P2, FB2)

Without strong funding, organizations are likely to be unevenly geographically distributed, existing only where people are able to donate time in lieu of

paid staff. Additionally, projects may never progress past the stage of thought exercises, due to a lack of resources.

A package deal

Agency, demand, and resource must be understood as equally important elements in self-organization. Without all three functioning in harmony, self-organization cannot happen. This section offers an approach to understanding how these elements intersect with each other, as well as providing two short vignettes as examples of when self-organization does not function, due to a lack of one element, and when it does, with all three elements in harmony.

Figure 1 conceptualizes the idea that the three elements of self-organization must work in harmony. When only two of the three elements are present, there may be capacity, reason, or preparedness to act. However, this does not provide enough force to overcome inertia. For example, although there may be a reason to act (demand and resource), without an actor with the agency to act, no self-organization will occur. Resource and agency give an actor the capacity to act; and agency and demand make an actor prepared to act. It is only when the three intersect that self-organization occurs.

A lack of one of these elements was a regular issue during the COVID-19 pandemic. There were ample newcomers to LAFS, volunteers who were furloughed or looking for alternative employment, and brought with them ideas and energy (in other words, had ample demand and resource), but lacked agency due to insecurity or status as a novice. The COVID-19 pandemic created an imbalance, knocking agency out of kilter to demand and resource. Many volunteers were new to LAFS and did not have time for proper inductions or integration into the culture or ways of working. This effectively led to a glass ceiling on self-organization, which is illuminated in the following vignette from the author's fieldnotes:

It is hot outside, but cool in the barn where we're doing the packing. Volunteers are working in teams of two packing the small, medium, and large boxes. I'm the floater, which is less grim than it sounds. I move between the teams, bringing them bags of veg or boxes of fruit, making sure they've got cups of tea. Sara² is wrapping bread in large sheets of paper, sourdough loaves stacked on the counter waiting to go to their boxes.

Sara is with us because of Covid, an energetic woman, full of vitality, normally at work but she's been furloughed. She's a friend of a friend, and has been coming to help us pack and deliver veg boxes for a few weeks. She seems to know what she's about.

She waylays me, and I stop walking. She's a chatterer. She asks if it wouldn't be less wasteful if we had permanent bread bags for the loaves, something customers would receive in their box and then send back.

It sounds a lot of faff. Getting them produced. Washing them. Getting customers to return them. But also, there's a lot of money being thrown at local food hubs right now,

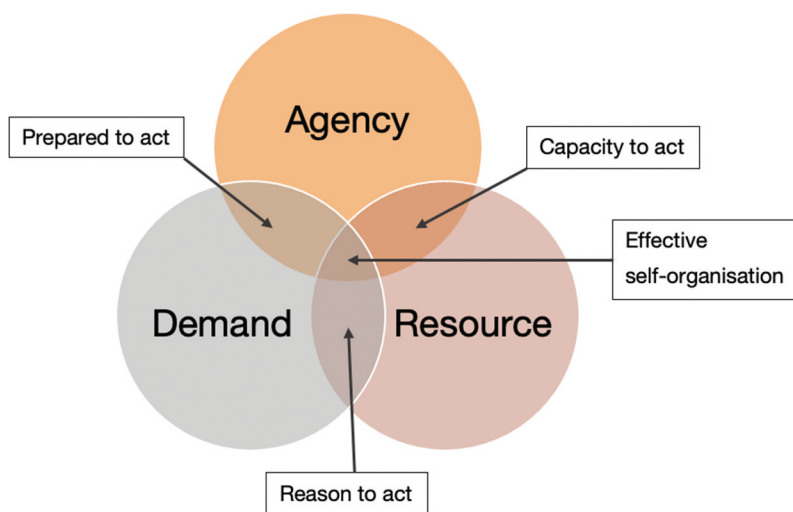


Figure 1. Agency, demand, and resource must all be present and in harmony for effective self-organisation.

and it might be a good marketing exercise. Also, it's Sara's idea, and if she wants to do an experiment, cool.

We talk about waste, which we've all noticed has become a problem, the wholesalers sending us mountains of plastic-covered fruit and veg. I don't think the paper is as much of a problem, but Sara thinks bread bags would go a long way. And we could use something similar for mushrooms, too, and maybe some other veg. I wonder who is going to do the extra laundry.

One of the medium box packing team members calls for a veg top-up, so I hop off the counter to help. Before I wander off, I tell Sara that it's a cool idea. If she's really keen, I'll send her some supplier links. If she can do a rough cost calculation, I'll track down some money for it. All she has to do is cost it up and tell us what to order.

But, although it was her idea, Sara didn't think she was the right person to pursue the project. She felt she wasn't a representative of the organisation, wasn't the person to make it happen. So, it never did.

In this example, agency, demand, and resource were not in harmony. The volunteer lacked agency, and would have needed support from staff to operationalize the small project. She didn't want the responsibility, and the staff didn't have the capacity to nurture newcomers' ideas and passions. Though demand and financial resource were present, a lack of volunteer agency meant the project didn't progress. The staff member, who didn't lack agency, did lack time (resource), and didn't pursue the project. Two of three elements are simply not enough to drive thought into practice.

Conversely, when agency, demand, and resource were present and in harmony, effective self-organization occurred. Another vignette, from a community garden in Freiburg, shows that the three in combination, even at a very small scale, makes

the difference between being stuck at “reason to act,” “capacity for action,” or “preparedness for action,” those spaces between two of the three core elements of self-organization, and the act of self-organizing.

We are at the Community Garden, three of us working in the garden and talking about Leonie’s³ job. Leonie shows us what to do in the bed we are tending – pull out the weeds and the stones, throw them into trugs, tip the trugs onto the compost heap. It is not hard work, but there the third person is new to gardening and can’t tell the difference between a weed and a crop. Leonie explains. Then something comes up at the hut and she wanders off.

A newcomer arrives, and we wave her over. She joins us and says she is new to the city, and wants to meet people. She asks if she can join us. We welcome her, and explain what we’re doing. She kneels down, and we continue weeding.

Leonie waves me over, and I stand to join her. As I do, a new person joins the weeding group, and the first volunteer, who had previously known nothing about weeding or much about the Community Garden, passes him my trowel and fills him in on the task at hand. She knows what they’re doing, feels confident and able to manage the situation.

These vignettes do illustrate different types of work – the first requiring more time, independence, and initiative, the latter responding to an immediate need. However, the act of enabling volunteers, even in small ways, equipped them to transition quickly from newcomer to leader, able to respond to late arrivals to the garden’s work party. Volunteers arrived with only demand – to learn more about the project – then demonstrated resource by contributing to the work. Through coaching and information from staff, they quickly acquired agency, enough so that when left to themselves, they felt able to assume responsibility for inducting other newcomers. This freed up the staff member to move to other tasks, increasing overall resource for the community garden. Or, as one interviewee said:

And that’s the big secret, in the end it’s no secret at all, but it makes a lot of things easier. And I think that’s one of the reasons why this garden and the concept is so successful. There are people preparing this. This means that the people who want to participate can come and work. (P1, FB4)

6. Summary and conclusion

LAFS are a critical part of a diverse food ecosystem, and have gained increasing recognition in local, national, and global discourse. Their popularity and recognition increased during the COVID-19 pandemic, which put pressure on LAFS to serve local communities through increasing localized sourcing, delivery, open-air markets, food aid, and solidarity actions. The extra demand, along with supply chain problems and an increase in the volunteer workforce, led to increased self-organization within and between LAFS organizations.

Though the pandemic is far from the only reason for self-organization in LAFS, it created a space for rapid decision-making and action. The COVID-19 pandemic was a chaotic period for many LAFS organizations and actors that exacerbated the amount and speed of self-organization that they undertook. In order to enact the rapid responses that they are noted for (Burnett and Owen 2020; USDA 2021), LAFS actors had to self-organize rapidly, from small-scale, everyday decision-making to crisis responses.

This study spanned both the everyday and crisis response, starting before the COVID-19 pandemic and ending just after, which gave rich insights into LAFS self-organization. It highlighted the need for three core elements – agency, demand, and resource – that made it possible to enact effective self-organization, a space in which ideas could transition from thought into action. This paper argues that without any one of these elements, or when these elements are not in harmony, self-organization is highly unlikely to materialize. Effective self-organization can mean the difference between staff members working within their capacity, or burning out; it can mean that volunteers are able to take independent decisions and carry them through; it can inform whether an organization evolves or remains rigid; it can be the difference between food being distributed or wasted. The results of the field work and analysis show that, regardless of location, self-organization, which is critical in both daily decision-making and crisis response in LAFS, relies on agency, demand, and resource. While many researchers have explored one, or sometimes two, of these elements, some in great depth (see, for example, Anzola, Barbrook-Johnson, and Cano 2017; Denters 2016; Uitermark 2015), none have previously drawn together all three elements.

Following decisions by the UK and German governments to treat the pandemic as essentially “over,” there has been a snap back to pre-pandemic “normality.” This is causing a new wave of chaos in LAFS as customers largely return to supermarket shopping; LAFS lose volunteers, income, and media attention; and there is increasing demand for food aid. The COVID-19 pandemic raised issues around food supply chains, with increased recognition of the importance of LAFS and diverse supply chains. However, the promised transformations do not seem to be lasting. While this paper explores new ways of understanding upstream requirements of self-organization, others have already explored downstream impacts, linking self-organization to longer-term transition (Armendáriz, Armenia, and Atzori 2016; Hasanov, Zuidema, and Horlings 2019). Exploring the intersection of self-organization and longer-term transformation of food systems through the lens of an agency-demand-resource conceptual framework would be an important next step to gain a better understanding of moving from self-organization to organization, or a new stable state of being. It might help to clarify why we have not seen a sustained reconfiguration of the food system.

Future research would do well to atomize these elements further, looking in particular at the role of agency within LAFS and how to foster agency without

cannibalizing resources. The results suggest that these core elements of self-organization are not place- or context-specific, but generally apply to LAFS in WEIRD countries. However, the two study locations held a lot of similarities. Future research should incorporate LAFS in different settings, including urban, peri-urban, and rural environments, and non-WEIRD countries, applying the same conceptual framework to explore agency, resource, and demand within self-organization.

This research does not use self-organization as a metric for LAFS success, but rather discusses the ways in which self-organization can be more (or less) successful in its own right. It does not pass judgment on whether LAFS are “successful” based on their self-organizational capacity. It is possible for an organization to be quite rigid but be effective or successful measured against their mission statement and in their experience. However, as many LAFS rely extensively on self-organization, understanding what makes it most effective is a valuable resource for practitioners.

Notes

1. All German quotes translated by the author.
2. Pseudonym.
3. Pseudonym.

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