

Regenerating food systems : A social-ecological approach

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REGENERATING FOOD SYSTEMS

A social-ecological approach

Jessica Duncan, Michael Carolan, and Johannes S.C. Wiskerke

Introduction

The future of food is uncertain. Rising levels of malnutrition, inequality, and environmental degradation point to the failure of food systems to deliver safe and healthy food for all. As this book goes to press, roughly one in five people around the world are under lock-down we collectively face down the Covid 19 pandemic. Yet people still need to eat. This has proven hard for some as supply chains buckle under the weight of households hoarding foodstuffs. Meanwhile, meat processing plants are closing, as workers, without health care, fall ill and die. To say nothing of the waste, like the US dairy farmers who had to dump millions of gallons of milk once under contract to any of the thousands of schools shut for the remainder of the academic year. Crises always highlight the core flaws of any system. As Covid-19 remains fresh in our minds, we hope these limits turn into opportunities as we realize the need for new way of thinking about we organize food systems.

As a concept, sustainability has evolved a great deal since the late 20th century, expanding beyond academia to become ‘an orthodoxy for discourses’ across the public and private sectors (Axinte et al. 2019, 120). There is quite broad agreement about the multi-dimensional nature of sustainability as a concept in so far as it includes the pursuit of social equity, the creation of human welfare (often through economic means), and the maintenance of a natural resource base (Béné et al. 2019, 123). The so-called Brundtland Report (1987, para. 23) added a time dimension: that we must ensure sustainable development ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’.

The 2030 Agenda for Sustainable Development, launched in 2016, builds on these developments and puts forwards a global plan of action. With the formal adoption of the 17 interconnected Sustainable Development Goals (SDGs), governments are tasked with developing pathways towards social, economic, and environmental dimensions of sustainability. The ambition of a regenerative food system is in line with the SDGs and reflects the realization that radical, systemic changes are needed if we are ever meet those ambitious but existentially necessary goals. To be *regenerative* implies a degree of cumulative emergence – a more-than-the-sum-of-the-parts type of outlook that is interested in more than maintenance.

The SDGs have set the international agenda for addressing sustainable development and they reflect a complex and broad view of sustainability, albeit with limitations. Practical strategies for achieving these aims remain unspecified and discussions around sustainability are frequently

Table 1.1 Relations between regenerative food systems and the SDGs

Goal	Relation to regenerative food systems
Goal 1: No Poverty	A core value of regeneration must be to regenerate fair, equitable systems, where food producers receive a fair price for their products and where consumers have access to healthy foods at an affordable price. This will require a redistribution of financial flows in the food system and a radical change away from (who) profits in the food value chain.
Goal 2: Zero Hunger	Achieving food security – ensuring stable access to healthy and culturally appropriate foods at all times, for all people – through sustainable practices must be a top priority for decision makers around the world. Working towards regenerative food systems allows for an opening up of possible pathways to meet this goal while ensuring that solutions are grounded in local contexts and are working with the entire food system to regenerate soils, seeds, health and sustainable diets, and vibrant communities.
Goal 3: Good Health and Wellbeing	Regeneration of healthy foods and healthy systems is at the core of regenerative food systems. Key to regenerative food systems is recognizing the importance of wellbeing for regenerative systems and how to regenerate practices and relations that promote wellbeing.
Goal 4: Quality Education	Holistic education includes food literacy but also literacy in how to navigate the food landscape. Regenerative food systems require educational pathways that iteratively link back into the livelihoods, capabilities, and desires of communities and cannot be imposed from outside.
Goal 5: Gender Equality	The majority of food producers around the world are women yet they maintain unequal access to land, financing, education, and other resources. Equality, regardless of gender, is fundamental for maintaining food systems that regenerate values of fairness and equity. This principle must also extend across races, religions, abilities, and sexualities.
Goal 6: Clean Water and Sanitation	Regenerative food systems do not contribute to the pollution of water further, they are attuned to the responsible use of water.
Goal 7: Affordable and Clean Energy	Clean energy that is accessible to all will be needed to support regenerative food systems from farm to fork. A transition to clean energy will involve trade-offs and may lead to negative societal impacts in the short term, particularly for more vulnerable segments of society. However, acting now is likely to lead to less negative impacts than acting later, when it will arguably be too late. Ensuring that support systems are in place to limit the impacts on people will also be fundamental in the short to medium time. Funding this will be a challenge but feasible, for example through new approaches to taxation.
Goal 8: Decent Work and Economic Growth	Regenerative food systems are designed to give more meaning to existing food systems jobs. This entails a shift wherein there is broad societal recognition and appreciation of work across the food system and changes in payment and profit structures.
Goal 9: Industry, Innovation, and Infrastructure	Industry can play a key role in expanding or scaling up regenerative food system practices and principles but it is important that the concept of regeneration in relation to food systems not become co-opted by industry. This is fundamentally about practices. Similarly, investment in infrastructure can facilitate the uptake and integration of regenerative food practices.
Goal 10: Reduced Inequality	A regenerative food system has values of fairness and equity at its core. Reduced inequality relates to other goals such as access to food, gender equality, access to education and quality work with fair wages.

(Continued)

Regenerating food systems

Table 1.1 (Cont.)

<i>Goal</i>	<i>Relation to regenerative food systems</i>
Goal 11: Sustainable Cities and Communities	Regenerative food systems are key to sustainable cities and communities and are useful for advancing the three pillars of sustainability: ecological, social, economic. Cities are key leaders in food system transition and need to be actively developing integrated policies that move beyond sustainability towards regeneration.
Goal 12: Responsible Consumption and Production	The link between responsible consumption and production is key within regenerative food systems. For food production to be viable, there is a need for appropriate markets.
Goal 13: Climate Action	We are facing a climate emergency. Concrete and rapid change is needed from governments, the private sector, and broader society. Conventional agriculture is a major contributor to climate change. Regenerative food systems need to ensure that greenhouse gas emissions are limited. These will be different depending on eco-region. There is no single best solution. We also recognize that there may be contradictions when it comes to what is best for the climate and best for biodiversity. These contradictions need to be made explicit and democratic processes are needed to make difficult decisions.
Goal 14: Life Below Water	The sea provides a range of food products that are fished and harvested. Doing this in a sustainable manner, with a view to regeneration, is fundamental for not only maintaining but regenerating fish stocks and marine environments.
Goal 15: Life on Land	The goal of protecting, restoring, and promoting sustainable use of terrestrial ecosystems is fundamentally aligned with the objectives of regenerative food systems.
Goal 16: Peace and Justice, Strong Institutions	The promotion of peaceful and inclusive societies is a core value of regenerative systems. Food insecurity and hunger are on the rise and conflict contributes to this. We can expect greater conflicts as the impacts of climate changes increase and there is more migration. Regenerative food systems that are adaptable to climatic changes and climatic variability are fundamental to limiting conflict, particularly in areas of protracted crisis.
Goal 17: Partnerships for the Goals	There is a clear need to strengthen means of implementing systemic change towards sustainable and regenerative systems through global partnerships. Indeed, an integrated approach that sees cities, nations, regions, and international actors working together in a comprehensive and coherent way is needed to pave pathways to regeneration. At the same time, it is fundamental that local contexts are respected and one-size-fits-all solutions are avoided.

reduced to the environmental dimension (Béné et al. 2019, 123). Further, progress towards achieving SDG 2 – to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture – is far from positive. Data from 2016 suggest that the number of chronically undernourished people in the world increased to 815 million, up from 777 million in 2015 (FAO et al. 2017). That same year, 21 countries experienced high or moderately high domestic prices for one or more staple cereal food commodities (UN 2017, 4). Aid allocated to agriculture from member countries of the Development Assistance Committee of the Organization for Economic Cooperation and Development (OECD) remains where it was in the late 1990s, at 7 per cent. The prospects of achieving a sustainable future are looking bleak.

One challenge is that, despite international agreement around 17 goals and 169 targets, sustainability remains a contested and political concept and process (Béné et al. 2019, 124; Eakin et al. 2017, 3). While most agree that our food system is failing, what the failure is

about is less clear (for a summary see Béné et al. 2019) due to competing interpretations of key problems, solutions, and competing interests (Béné et al. 2019; Moragues-Faus, Sonnino, and Marsden 2017). Further, understandings of sustainability and food systems are informed by the underlying values that shape how experts view and interpret the world (Béné et al. 2019, 117; Eakin et al. 2017; Foran et al. 2014). Some experts point to the inability of the system to feed future populations, calling for a closing of the yield gap and investments in existing supply chains. Others are concerned about the inability of the system to deliver a healthy diet and call for a closing of the nutrient gap. There are those who are concerned about the inability of the system to produce equal and equitable benefits and call for enhanced grassroots autonomy. And there are those who think that the greatest failure is about impacts on the environment and push for a reduction of the ‘food-print’. Others see the failure as a mix of some or all these perspectives.

We acknowledge that the root of the problem is not narrative or conceptual, but we also know that how we talk about these challenges matters. From where we stand, it is clear that we need better concepts and new stories that position us as part of nature; not as sustainers of nature, but as active participants in an integrated cycle of regeneration. We need examples that refer to processes of enhancing the ability of living beings to co-evolve in ways that allow for diversity, complexity, and creativity (Mang and Haggard 2016, xiv); that invoke images of participating with the environment in harmony with ecological systems, instead of images of doing less damage (Reed 2007).

Sustainability, in its dominant form, is primarily an exercise in efficiency. With regeneration, we push for a shift in focus: to fundamentally rethink and redesign our food and related practices so that they (re)build and contribute to (i.e. regenerate) soil fertility, community cohesion, integrated policies, or sustainable diets, to name but a few. We accept that this concept will certainly be subject to many of the same tensions, challenges, and limitations as the concept of sustainability. However, unlike the verb sustain – to support or to cause something to continue – the verb regenerate means to produce or create. We argue for moving beyond ‘supporting’ and ‘maintaining’ towards ‘creating’ is what is needed – to engage in a politics and to afford practices that *add* to the world (Carolan 2013). While we need to move beyond business as usual, we also need to regenerate the systems that have been adversely impacted. This more adequately reflects the values and principles that are needed to move towards safe, just, healthy, and diverse food systems. Towards this end, we conceptualize regeneration as a holistic approach that moves past neutral environmental impact towards the creation of effects for a mutually supportive symbiosis across the food system (Axinte et al. 2019). From this approach, the human–nature dualism dissolves, making analytic and practical space for co-creating and co-evolving. It forces an engagement with the production of life, and on the ways this is cultivated.

Six principles for regenerative food systems

While many of the chapters in this handbook address practices which may be considered niche, it is important to note that these are not merely ‘alternative’ food systems: these are systems which foster agro–bio–socio–economic diversity. In turn, these chapters address many of the key challenges facing food systems (e.g. climate change, changing demographics, labour, access to land; soil fertility, displacement, animal welfare, food waste, health, and justice).

Taken as a whole, these chapters point to a number of key practices and ideas that would appear central to advancing regenerative food systems. We present them here as

principles for regenerative food systems, noting that these are not exclusive or clear-cut principles, but rather dynamic and cross-cutting.

The six principles are:

- 1) Acknowledging and including diverse forms of knowing and being
- 2) Taking care of people, animals, and the planet
- 3) Moving beyond capitalist approaches
- 4) Commoning the food system
- 5) Promoting accountable innovations
- 6) Long-term planning and rural–urban relations

Principle 1: to acknowledge and include diverse forms of knowing and being in the world

Many chapters in this handbook speak to the need to embrace diverse approaches to research, including Indigenous and traditional ecological knowledges. Towards this end, Levkoe et al. (Chapter 2) bring in an explicitly normative agenda for regenerative food system research that builds on theories and practices of decolonization, feminism, post-capitalism, co-production of nature and knowledge, and engaged scholarship to enhance a more traditional political economy approach. This aligns well with the arguments put forward by Chesnais (Chapter 5) on the need for cultural appropriateness in the development of regenerative practices. Going more specific, Dwiartma (Chapter 3) and Huambachano (Chapter 4) present traditional and Indigenous practices to illustrate the ways these can move us towards more sustainable and regenerative food systems. Blay-Palmer et al. (Chapter 6) show how existing frameworks including the Right to Adequate Food, the UN Declaration on the Rights of Indigenous People, and the Convention for the Safeguarding of Intangible Cultural Heritage can function to support Indigenous and traditional food systems. They argue that protecting cultural heritage is key to advancing regenerative food systems. In terms of including diverse forms of knowing in policy making and governance processes, Deijl and Duncan (Chapter 7) call for critical reflection and action when it comes to the design and roll-out of participatory food policy processes. They argue that policies for regenerative food systems need to be participatory and co-produced by a diversity of stakeholders and that meaningful and that representative co-production is needed.

Principle 2: taking care of people, animals, and the environment

A regenerative food future must have justice at its core. Towards this end, Stock and Szrot (Chapter 8) present a reflection on justice in relation to regenerative food systems, arguing that justice is a struggle to reshape reality in ways which allow for people to flourish. Looking specifically at labor, Sbicca (Chapter 9) explores tensions between food labor and technology by positioning these in class struggle. Engaging with class is key to position visions of regenerative labor alongside actually existing economic conditions, both historically and contemporarily. Hassink and colleagues (Chapter 10) focus on caring in agriculture. Using care ethics as a tool to analyse agricultural and food practices that aim to reconnect with society and nature, they argue that caring agriculture can transition approaches of control towards ones of

partnership and respect, values which must be at the core of any regenerative food system. Weis and Ellis (Chapter 11) turn to current debates on the role of animals in regenerative food systems and map out arguments for different forms of farming that take care of animals. Taking a different position in relation to animals, Amos and Bailey (Chapter 12) look at the management of fisheries, highlighting how our food systems are embedded within socio-cultural, economic, and ecological contexts. Focusing on examples from Canada they make a case for considering food systems as a part of complex environmental and human systems (sometimes referred to as social-ecological systems). In so doing, opportunities open up to align human health and wellbeing with environmental health.

Principle 3: to overcome capitolocentrism when it comes to understanding how people access food

As Levkoe et al. explain (Chapter 2), capitolocentrism refers here to the positioning of all market processes with reference to capitalism. With this principle we dare people to think and look beyond the constraints of capitalism to uncover myriad practices (existing and potential) that contribute to regenerative food systems. Schneider and Cassol (Chapter 13) place the discussion on agri-food markets within the broader scope of economic sociology, highlighting the analytical approaches to markets that have been mobilized by leading schools of contemporary sociological thinking. In so doing they uncover possibilities for dialogue and expand the explanatory potential of markets. Wegerif's (Chapter 14) contribution offers a more concrete entry point into thinking about how markets function in a non-capitolocentric way, through the concept of a symbiotic food system. Symbiotic food systems are organized around how people arrange their economic activities to meet their daily needs. Importantly, the concept includes reflections on the management of the tension between the individual striving to look after themselves and working in solidarity for the mutual benefit of the others involved.

Davies (Chapter 15) also highlights the importance of looking at what people do and how they organize to access food in her chapter on sharing. By mapping the digital traces of contemporary food sharing initiatives, she highlights a diversity of practices that exist, but are often overlooked, and which advance key tenets of a more sustainable and regenerative food system. Taking a broader view, Stephens and Clapp (Chapter 16) consider the impact of financial systems on food systems, and examine how social finance could potentially support more regenerative food systems in the context of financialization in the agri-food sector. Social finance refers to investment for social and environmental return, rather than purely for financial gain. This relates to questions raised by Carolan (Chapter 17) who, looking at smaller-scale entrepreneurs, calls for more discussion around businesses whose owners seek to maximize profit, particularly in light of the pro social trade-offs. Carolan also highlights the numerous ways that small-scale food entrepreneurs can become trapped in cycles of debt, while reminding us that gender dynamics need to be explicitly addressed in efforts to build regenerative food systems. While many innovations and practices exist outside of and or in opposition to capitalist approaches, we are also reminded that many people are working to make ends meet and to build businesses within a capitalist framework. For example, Nuñez-Solis et al. (Chapter 18) provide a case for individualised market strategies to support regenerative food systems based on their research into coffee production in Costa Rica. They show how some small-scale producers are moving away from international cooperative marketing structures (i.e. Fair Trade), opting instead for individualized, market-based strategies.

Principle 4: a commoning of the food system

As Ferrando (Chapter 19) explains, commoning the food system calls for qualifying food as a non-commodity, and as part of a commons. In this vision, food is a non-commodity at the center of an ecological organization structured around the principles of anti-colonialism, anti-patriarchy, equality, social justice, and on the recognition of the inherent co-construction of nature and society as intrinsically connected. This approach provides a conceptual entry point to engage not only with the status quo but also with the idea of multiple food systems that are both common and communing. The latter is argued to be a central process of interacting that is key as we move towards regenerative food systems.

Grivins (Chapter 20) builds on the idea of commoning food by considering foraging practices in relation to regenerative food systems. He argues that foraging also usefully creates new linkages between categories that are often perceived as contradictory – environment and person, the local and the global, the past and the present, and the traditional and the modern. Patnaik and Jongerden (Chapter 21) also challenge the view of food as a commodity by showing how conservation and sharing of landrace varieties and use of sustainable farming methods helped communities to interact and rebuild their farms. Their case study shows how seed sharing and collection through the space of commons can lead to the restoration, rebuilding, and regeneration of agricultural practices informed by traditional, Indigenous knowledge in ways that are beneficial for small-scale farmers and key to promoting regenerative food systems. Natividad and colleagues (Chapter 22) provide insights into different modes of management of life in agriculture and food by examining agrobiodiversity as the product of an aesthetic order. In so doing, they show how a situated reordering of food systems can contribute to the possibility of more regenerative agriculture, food, and nutrition.

Principle 5: accountable innovations that advance regenerative and just food systems

When thinking about regenerative food systems, it is clear that innovations are needed: business as usual is not an option (IAASTD 2009). In this context, we understand innovations as new forms of social practice and organization, as well as new or improved technological products and processes. Accountability is linked to what is seen as legitimate in a political culture; to what citizens in a specific setting and time period deem acceptable. This can be complicated when we consider that so many of the problems we face when it comes to food systems can be classified as ‘wicked problems’: problems of extreme consequence to humanity (and the earth) that are difficult or impossible to solve (Conklin 2006; Duncan 2015; Rittel and Webber 1974). This in turn links to the first principle, acknowledge and include diverse forms of knowing and being in the world. We recognize this only complexifies an already complicated matter, but as Einstein reminds us, ‘We can’t solve problems by using the same kind of thinking we used when we created them’.

Harnessing the positive potential for innovation to advance regenerative food systems means also recognizing that some innovations may contribute to environmental degradation, disrupt livelihoods, and exacerbate inequalities (UNCTAD 2017). As such, the innovations which are supported (with time, labor, financing, and policy support) need to account for social, ecological, economic impacts. Accountable innovation demands we ask key questions, such as what kinds of innovation are both needed and capable of being regenerative; queries that ultimately hinge on processes and principles of social inclusivity

and political transparency (Bronson 2019; Eastwood et al. 2017; van der Burg, Bogaardt, and Wolfert 2019). Processes that rely on co-production or citizen science could provide useful guidance here.

While it is clear that more thinking is needed as to how to hold private actors accountable to the wider society, it is also clear that we need to ensure that innovations (be they technical or social) are acceptable to the communities where they are being implemented, that they address root problems (not just symptoms), and that they are transparent in terms of who gets what, why, and how.

One key development within food systems innovations that aims to tackle root problems builds on the circular economy. Pascucci (Chapter 23) explains that circular economy is based on a number of key principles: resources need to circulate in closed loops; renewable energy should be used where possible; and diversity should be celebrated. He also highlights, importantly, that in discussions around food and circular economy, there is a polarization around two narratives, each of which leads to the identification of very different food futures. Using a food systems design approach he suggests two possible pathways for transitions: globalized industrial ecology and networked agro-ecology.

Bronson (Chapter 24) takes a closer look at the tools and technologies emerging in the field of digital agriculture. The research shows that, in the current economic and legal order, these innovations do not yet support regenerative purposes but are rather reproducing a number of social and cultural food system challenges. Yet it is also clear that there is an opportunity to shape digital innovations and their infrastructures for a diversity of food system actors. We reiterate here the importance of accountable innovation.

Macharia (Chapter 25) presents possibilities for new pathways for innovation at the farm level. Exploring relationships between digital technologies, medium-scale farmers, and the phenomenon of telephone farming he shows how digitalization can change business processes. These digital technologies engender specific effects which in turn reshape the debate on how we think and talk about agri-food-based technologies.

Principle 6: the importance of planning for the advancement of regenerative food systems

Regenerative food systems require thoughtful, deliberate, and long-term planning. Central to planning for regenerative food systems is rethinking the rural/urban divide. Woods (Chapter 26) usefully considers the significance of rural-urban linkages in current and future food systems. This is fundamental as food is at the core of the rural-urban relation. Contemporary food systems involve rural-urban interactions that stretch over longer distances, and in turn create dependencies between non-adjacent localities. While urban agriculture is gaining much needed attention, it is clear that the global countryside feeds an increasingly urbanized global population. In turn, Woods notes that a transition to more sustainable forms of farming is likely to involve the relocation of food production back closer to urban markets, including the reinvigoration of urban and peri-urban agriculture.

Morse et al. (Chapter 27) address some of these concerns by taking a landscape perspective on planning. In their chapter they highlight the promise of working landscape policy approaches for engaging public support for progressive food production policies. Their reflections illustrate the importance of funding, culture, place, and human-environmental interactions in developing appropriate policies. Further, taking a landscape view to planning pushes people out of silos and allows for improved dialogue around the possibilities and potential of landscapes for regenerative ends. Ilieva (Chapter 28) expands on

this idea: by taking a foodshed approach to food-city co-evolution she presents clear reasons why planning for regenerative food systems is a vital new frontier in city planning and agri-food planning more broadly.

Soma (Chapter 29) brings us back to a circular economy approach and challenges us to reflect on the categorization of food and waste. In so doing, she aims to provide alternative ways to view and value food. From the perspective that food waste is a resource, Soma outlines how waste can be managed better in a regenerative food system, without losing sight of unequal and uneven waste collection. In explaining how food waste can become a resource within a circular food system, she also draws attention to the urgent need to revitalize biodegradable food packaging.

Finally, Ionis (Chapter 30) presents a broader reflection on the relations between food insecurity and the market-based globalized world. He reminds us that in our current state of climate and food crises, efforts are underway to present these as non-political crises that can be overcome through the incorporation of more production areas and more input-intensive technologies. He usefully reminds us that crises are moments where we need to react.

While developing this book we repeatedly asked ourselves: do we need a new label? With agroecology, permaculture, climate smart agriculture, ecological intensification, sustainable intensification, do we really want to engage with yet another concept. Since you are reading this, you have already figured out that the answer is yes. There are two main reasons we came to this decision.

First, we note that regenerative is emerging as a new buzz word in the agri-food domain and it is important for us to get a handle on what it means and how it can be usefully applied. The term regenerative is one that is emerging in some scientific disciplines – spatial design for example (Cole 2012a, 2012b; Mang and Haggard 2016), but also in the sociology of food and agriculture – and we look at it as a step beyond sustainability. This leads us to the second reason. We identified an opportunity to participate in the shaping of this concept, from a socio-ecological perspective, to help move us beyond some of the limits of sustainability. As explained above, we need a concept that can better reconcile relations between the social and environmental; one that actively locates society and community in its models. We can see value in the concept insofar as it can challenge the dominant scientific mindset that is busy with input/output level analysis and de-political constructions of sustainability (Duncan 2015, 2016). This handbook thus moves us beyond the boundaries of sustainability, to focus less on maintaining systems, towards practices that build and regenerate ecosystems, communities, and cultures. Regenerative approaches to food systems seek to understand and implement practices that reinstate and regenerate over time. These approaches take into account not only farming systems, but also farm families, fishers, pastoralists, workers, migrants, rural communities, landscapes, and regions and ecosystems. They are key to our collective food futures.

Discussion questions

1. We have proposed six principles to inform a transition towards regenerative food systems. Can you think of other principles and reflect on what they would add?
2. We argued that thinking about regeneration moved us beyond the nature–culture binary and allows for thinking around co-creation. Can you think of examples of what this kind of thinking looks like in practice?
3. How does a ‘regenerative’ lens complicate recent investments by industry to promote sustainability along the supply chain?

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