Critical Mapping for Sustainable Food Design

Food Security, Equity, and Justice

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Introduction

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Introduction

Today, our worldwide struggles—against climate change, socio-economic and environmental disparities, political divisions, conflicts, trade struggles, and health issues—show the need for more sustainable design moving forward. Attaining sustainability requires transdisciplinary coordination and collaboration from all fields, and across a spectrum of design areas, including architecture; engineering; communication; marketing; visual arts; visual communication, information, and graphic design; product design; interaction design; experience design; and others.

In this book, we look specifically at sustainability in food security through the lenses of equity and justice. Grubinger et al. (2010, as cited in Chase and Grubinger 2014), define food as a system:

> an interconnected web of activities, resources, and people that extend across all domains involved in providing nourishment and sustaining good health, including production, processing, packaging, distribution, marketing, consumption, and disposal of food. The organization of food's system reflects and responds to social, cultural, political, economic, health, and environmental conditions and can be identified at global scales, from a household kitchen to a city, county, state, or nation.
>
> (6)

This view of food makes food insecurity the epitome of a "wicked problem" (Buchanan 1992; Rowe 1986; Rittel and Webber 1973; Churchman 1967). The term "wicked" refers to a daunting complexity, problems that take place within an evolving system of highly interlinked, deeply embedded, cross-cultural, and cross-disciplinary challenges. So, too, are the solutions within the wicked problem's system. Bennett (2012b) proposes that a wicked problem requires a wicked solution—an equally complex system of design outcomes (DOs) that address it. Figure I.1 illustrates a model of Bennett's wicked solution concept showing how social designers and innovators can contextualize existing DOs across a field of possibilities mapped by two sets of dimensions: top-down versus bottom-up and localized versus memetic.

Manzini (2014) introduces the top-down and bottom-up polarity[1] in design as where change starts; that is, it starts with those who are driving it (57).

Top-down interventions tend to come from private and public institutions. We receive some policies backed up by laws, and do our best to implement them or suffer the consequences. Or we receive some product that is too tempting not to use; the corporation gets compliance simply by making the alternative technologically unavailable to its users. Bottom-up interventions, in contrast, come from individuals, communities, networks of individuals, and so on. Whether that is a social movement that spreads across the nation, like Black Lives Matter, or just a neighborhood effort, like holding all the garage sales on the first Saturday of each month in a particular town, there is neither the force of state power nor the force of economic might behind it. Such people-powered phenomena feel different: more authentic perhaps, more voluntary, more like a "direct democracy" (Matsuska 2020) than representatives deciding for us, or marketing staff creatively scheming to create consumer loyalty and market exclusion (Bougette et al. 2019).

In addition to top-down vs. bottom-up, we can make a further distinction with the degree to which the solution is localized. In the case of Black Lives Matter, the movement began in an inherently decentralized, non-geographic fashion: across Twitter. Many movements and other phenomena today propagate in this meme-like spread, and for that reason, we will refer to it as *memetic*. At the opposite end of that spectrum, there are bottom-up phenomena that are highly localized and geographically specific: community events such as tailgate parties and sandlot baseball in the US (or pub night and a kick around in the UK), and so on. But it is indeed a spectrum, and we need to be able to consider all the forms that land somewhere in-between.

Thus, our map of wicked solutions has two dimensions. Along the vertical axis are DOs that emerge bottom-up by individuals and lay communities impacted by the wicked problem, or top-down from privately or publicly funded professionals. Along the horizontal axis lies DOs that range from decentralized memetic spreading to localized or those situated in a particular geographic context.

Why bother with this kind of mapping? Due to the complexity of both the problem and solution contexts, it is hard to see the system's state at any one moment. Critical mapping enables the visualization of the wicked solution in terms of its flow of control (top-down vs. bottom-up) and flow of communication (memetic vs. localized) without getting bogged down in the details before we are ready for them. Most importantly, it helps us to map changes over time. Moving from top right to left and down, DOs that populate quadrant A are top-down and localized, emerging from positions of economic power and may be implemented or regulated through large-scale commercial or cultural production that is limited to a geographic area (e.g., one nation or household). DOs that populate quadrant B are top-down and memetic and thus differ from quadrant A in that they may be implemented or regulated through large-scale commercial or cultural production that permeates global geographic boundaries (e.g., many countries or households). DOs that populate quadrant C are bottom-up and memetic and emerge from lay positions of power and authority (e.g., citizens) that may effectuate mass consumption through technological mediation and other forms of widespread
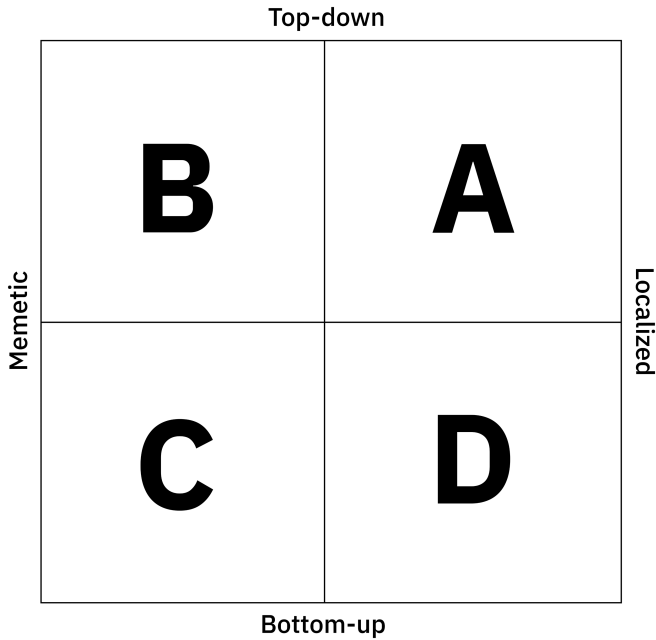
Top-down

B   A

Memetic   Localized

C   D

Bottom-up

Figure I.1 A wicked solution comprises an assemblage of existing DOs onto a grid of four
           quadrants, contextualized across two dimensions. Image courtesy of Audrey G.
           Bennett.

consumption or cultural production and appropriation. Finally, DOs that popu-
late quadrant D are bottom-up and localized.

The wicked problem of food insecurity, inequity, and injustice can be described
as a perennial state of pursuing but never attaining a sustainable balance where
all of humanity gets sufficient healthy food within a productive environment.
Instead, what prevails seemingly is the opposite: a lingering state of food inse-
curity amid environmental deterioration exacerbated within marginalized com-
munities. Yet, as food insecurity continues to challenge the healthy sustenance
of humanity, society has an evolving repertoire of existing, localized DOs scat-
tered across the globe like disconnected nodes in a dysfunctional system. Lack of
access to or knowledge about these existing food design assets—interventions,
resources, and knowledge—perpetuates food insecurity, health problems, and
environmental deterioration, particularly in underserved communities.

Food insecurity is one of many wicked problems in society that is garnering
increasing attention within the design field. Flood and Sloan (2019)—at the
"Food: Bigger Than the Plate" exhibit they curated at the Victoria and Albert
Museum in Britain—note that design has been fundamental to food since indus-
trialization, with design practitioners participating in every aspect of the com-
modification of food from its production to its consumption (13). Both Flood and

Sloan (2019) and Manzini (2014) provide ample examples of past and present, top-down and bottom-up designs addressing food worldwide. Designers who seek real-world problems affecting humanity and the environment may choose food insecurity as the problem to address based on perhaps a negative food-related experience they've had, other personal or professional interests unrelated to direct life experience, or even community needs identified through primary or secondary research.

Whatever their rationale for choosing food insecurity, designers[2] who pursue this wicked societal problem in their research undoubtedly will confront the question: where in the food system can design intervene to bring about more sustainable change? Answering this question effectively is a challenge as it requires knowledge of the current state of the food system in which DOs already exist that impact the food security problem but may not be accessible to a broad audience. Thus, the purpose of this book is to compile these DOs, organize them according to their relevance to a particular part of the food system, and by doing so, facilitate analysis and understanding that informs future sustainable food design development.

As critical thinkers and makers, designers are varied in their creative problem-solving approaches. Frequently, they may come to the design process with an outcome already formulated in their heads. Solution-focused design methods for addressing complex challenges like food and the outcomes they generate seem to dominate design processes; however, less time is given to the problem definition phase. How can one address a wicked problem like food insecurity if one cannot understand the problem or see the current state of the system? And even if an intervention is designed, how can one access the solution if its complexity rivals that of the wicked problem itself? Surely some means of mapping changes over time is required.

In solution-focused design methods for addressing complex challenges, conceptualizing and making the outcome arguably dominates most of the time in the design process, which limits time spent on problem definition. Critical mapping addresses this by letting us put problem definition, intervention design, and follow-up assessment on the same map. In doing so, we can resolve a tension that is built into the very notion of "design." On the one hand, if we cannot predict outcomes, why hire a design team? On the other hand, if we are not putting resources into tracking outcomes and making corrections, how can we call ourselves responsible professionals? Critical mapping is thus an organizational framework that assumes problem analysis, intervention creation and making, and outcome response need to be approached as an evolutionary process, allowing the design to be democratically modified and corrected by those most affected (Dorst 2019).

This book introduces a problematizing, reflective approach to the creative design inquiry process called critical mapping. Critical mapping entails compiling existing peer-reviewed DOs engaged in systemic interaction towards addressing a wicked problem, and organizing them visually and affinitively towards identifying places to intervene in the system to design a more sustainable future. In critical

mapping, a wicked solution is visualized as a diagram onto which peer-reviewed DOs are charted for analysis. It is a problem-definition framework to critically analyze systemic societal problems like food insecurity and make evidence-based decisions towards a more sustainable future. In terms of food insecurity, critical mapping permits cognizance of the interaction and interdependence of effectuated and effective DOs in the food system towards identifying what environmental scientist Donella Meadows introduced as "leverage points … places within the system where a small shift in one thing can produce big changes in everything" (Meadows 1999).

Critical mapping begins with secondary research on the wicked problem and its current and evolving wicked solution. First, the wicked problem is named, operationalized verbally and visually with evidence, and grounded with statistical evidence. Then, the second step in critical mapping is to conduct a transdisciplinary and integrative literature review to identify and compile existing, peer-reviewed DOs that address the wicked problem. These DOs are then filtered to isolate those that are sustainable. The third step entails affinity diagramming—visually organizing and plotting the sustainable DOs onto a wicked solution grid visualized across a field of possibilities, towards identifying leverage points or gaps targetable by design innovation or appropriation. Along the vertical axis are DOs that emerge bottom-up from individuals and communities impacted by the wicked problem (e.g., artwork) or top-down from privately or publicly funded professionals (e.g., scholars). Along the horizontal axis lies DOs ranging from memetic (e.g., community gardens) to localized (e.g., sack gardens), that is, from widespread adoption to local use. In the next-to-final step of critical mapping, we analyze the wicked solution and identify the leverage points.

There is precedence for this kind of mapping framework in addressing wicked problems in a global society. For instance, in 2020, Johns Hopkins' Coronavirus Resource Center employed data visualization to show day-by-day infection and vaccination rates globally and hyper-locally (Dong et al. 2020). Health experts and laypeople could see where infection rates were spreading and at what rate. Relatedly, critically mapping existing sustainable DOs that address a wicked problem can enable designers to critically analyze the system to identify leverage points. From there, they can synthesize the impact of the existing solutions and see where lacunae exist to address human needs equitably and in a just manner; such solutions can potentially make a meaningful impact that propels society further towards sustainability and annihilating the wicked problem. Visualizing a wicked solution to food insecurity can arguably facilitate the identification of gaps in the complex food system that, when filled, can move us forward to creating a more sustainable future that is food secure, equitable, and just.

This book carries out the first four of the following five steps of critical mapping for food insecurity where we (1) name and operationalize the problem, (2) conduct a transdisciplinary and integrative literature review of peer-reviewed scholarship to identify and compile sustainable food DOs, (3) map DOs onto a wicked solution visualization, (4) analyze the wicked solution and identify gaps or leverage points for further innovation or appropriation, and (5) conduct primary research within

communities grappling with the wicked problem to identify assets to include in the evolving wicked solution or adapt a sustainable food DO already included in the wicked solution to a new local context. Using food insecurity as the wicked problem, it compiles and maps existing sustainable food DOs from an integrative review of literature across disciplines and assesses the current state of the food system towards identifying leverage points or places where designers *should* intervene.

The first chapter, titled "Critically mapping a wicked solution to food insecurity," introduces, updates, and extends Grubinger et al.'s (2010) categories of the food system to include the additional categories of agriculture/aquaculture and access, with sustainability being integral to all of the categories. Thus, the proof-of-concept visualization of the wicked solution to food insecurity illustrated in Figure 1.10 includes eight food categories—agriculture/aquaculture, processing, production, distribution, communication (including recall, marketing, safety, and packaging), access, consumption, and waste. Each category comprises sustainable food DOs (listed and categorized in Appendix II) across two spectra—top-down (institutionally supported) to bottom-up (through citizen or community agency) and localized (affecting a limited amount of people) to memetic (widespread and affecting many)—that contribute to the wicked solution to the wicked problem of food insecurity. Chapter 1 discusses the following sustainability criteria for identifying existing sustainable DOs to populate each quadrant of the wicked solution to the food insecurity system: ethical, environmentally friendly, evidence-based, economical, ecological, effectuated, equitable and just, and enduring. Chapter 1's visualization of food insecurity's wicked solution provides the structure for the next four chapters of the book, where each corresponds to one of the four quadrants A, B, C, or D of the wicked solution. Chapters 2–5 discuss each of the four quadrants and the sustainable food DOs they hold. Each chapter represents one quadrant and includes descriptions of each sustainable food DO, identified from the transdisciplinary and integrative literature review of peer-review publications and our sustainability analysis. Each chapter concludes with an analysis of the quadrant to identify possible leverage points for future design innovation or appropriation.

In the second chapter titled "Quadrant A: Local, sustainable food design funded or supported by public or private institutions," we analyze the existing DOs of food insecurity's wicked solutions that are top-down and localized. Then, in the third chapter titled "Quadrant B: Widespread, sustainable food design funded or supported by public or private institutions," we describe and analyze existing DOs of food insecurity's wicked solution that are top-down and memetic. In Chapter 4, titled "Quadrant C: Widespread, sustainable food design created by citizens," we describe and analyze existing DOs that are bottom-up and memetic. Next, in Chapter 5, titled "Quadrant D: Local, sustainable food design created by citizens," we describe and analyze existing DOs that are bottom-up and localized. Chapters 2 through 5 each conclude with an analysis section titled "Places to intervene" that discusses the leverage points that emerged from the analysis of the existing DOs and the gaps between them to identify places within the

food insecurity system that need intervention through design innovation or appropriation.

In the concluding chapter of the book, Chapter 6, we reflect on the analyses of the gaps in existing activities in the food system that may be inhibiting society's ability to yield a present reality of sustainable food. We discuss the limitations of our critical mapping process and propose how readers, through a research agenda, can engage with a variety of professional and community stakeholders to innovate or appropriate sustainable food DOs to address food insecurity. Then, we describe future work related to the fifth step of critical mapping, primary research with local communities on the further development of the wicked solution to food insecurity through multimodal communication of existing sustainable food DOs to communities who may lack the technological infrastructure to gain access to them.

Critical mapping, as a problematizing framework, has the potential to facilitate knowledge exchange around wicked problems (like food insecurity) and their existing wicked solutions (like sustainable food design) among professional design practitioners and researchers and other lay and professional stakeholders who may be situated remotely in different spaces, places, and times. This book, on a micro level, will be useful to anyone seeking insight into addressing the wicked problem of food insecurity in their private and public spheres of access, experience, power, and control. On a macro level, it sets the stage for a design future that facilitates the harvesting of wisdom from peer-reviewed scholarship towards social design, innovation, and appropriation that changes the world for the better by alleviating food insecurity in ways that are more equitable and just.

Notes

1 DESIS Network founder, Ezio Manzini, defines top-down stakeholders as experts, decision makers, or political activists, and bottom-up stakeholders as the people and communities directly involved in the social problem (57).
2 Manzini (2014; 2015), Benjamin (2019), and Costanza-Chock (2020) define the word "designer" broadly to include professionals with formal training in design as well as lay people doing design who do not have formal design training but fancy themselves as designers. We endorse their definitions in our own operationalization of "designer" to include laypeople and professionals (with or without formal design training) who may not self-identify as a designer but are producing, making, creating, and innovating technology and DOs. Thus, a designer is anyone who generates intangible and tangible outcomes through creative problem solving.

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