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Bringing a systems approach to food systems
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New thinking on "regional"

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In 2010, we presented a set of arguments and assumptions supporting the value of regional thinking and the regional scale in food systems work in papers that we wrote under the aegis of the Northeast Sustainable Agriculture Working Group (Clancy & Ruhf, 2010; Ruhf & Clancy, 2010). We pointed out that local food has resonated with the public, producers, and marketers, and that it has inspired many supportive public policies. We also talked about some of the drawbacks of the focus on "local"—its varied definitions, and its shortcomings as a framework for sustainable and resilient food systems.

We described how regions, which go beyond the local scale, play a unique and essential role in meeting the food needs of a population. Regions also play an important role in sustaining food chain participants and the natural resource base in the face of environmental, social, economic, and climate uncertainty. To us, "regional" signifies a substantial volume and variety of products that can more fully address demand when compared with "local" foods."

Regional implies a larger scale, often multistate, but is not strictly limited to a radius or state boundary. We believe that the regional scale is one of multiple scales—along with local, national and

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global—that will produce food for the American diet into the future. Regional-scale food systems consider at a landscape scale certain needs and limitations, such as transportation efficiencies, broad land use and protection, energy use, production systems, and climate. Using a regional scale provides an essential context for addressing cultural dynamics and differences, natural and human-made disturbances, and diversity and equity challenges that cannot be adequately encompassed at the local scale.

In the last decade, more discussion about "regional food systems" has appeared in both academic and popular literature. However, despite growing sophistication about food systems, "local" and "regional" are still often taken to be synonymous, interchanged or conflated. In one example the two terms are defined as being exactly the same (Sustainable Table, n.d.). In a new report, despite "regional food system" appearing in the title, the terms local and regional are used throughout with virtually no differentiation (Dumont, Davis, Wascalus, Wilson, Barham, & Tropp, 2017). In a recent paper, the term regional is utilized consistently even though the material cited is describing local (Mittal, Krecji, & Craven, 2018).

We argue that to significantly advance many sustainable agri-food system objectives, "regional" and "thinking regionally" need distinction and attention. If we conflate the terms local and regional, and do not distinguish regional as a legitimate and necessary food systems framework, we lose its place, power, and potential to achieve our overall vision as well as to implement practical strategies. We bolster our arguments here with highlights from a number of new research papers—especially those related to scale, climate change, resilience, and systems approaches.

As Born and Purcell (2006, cited in Palmer et al., 2017) point out, scale itself has no inherent merit; the contributions of a specific scale depends on how well they serve a particular goal. If greater food self-reliance (not self-sufficiency) is a goal, then attention at the regional level is essential to advance the ability of any area to utilize its land and other resources to maintain and enhance productive farms and farm access, and to feed more of its residents. Significantly greater supplies and varieties of food for a larger population can be more adequately fulfilled at a regional scale, compared to a local one. If self-reliance goals are only set at the local level, those communities do not see their role in a larger context (Carlsson, Callaghan, Morley, & Broman, 2017). We made this point with regard to land use and farmland preservation in our earlier work, but it applies to all resources, including water and energy. In the Enhancing Food Security in the Northeast (EFSNE) project, researchers found that a number of foods are produced and sold throughout the region. They also found that more food could be produced under a variety of growing conditions and supply chain adaptations on a regional basis (Clancy et al., 2017).

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Many experts have pointed out that resilient systems must exist at multiple scales (Schipanski et al., 2016). There is a need for integrated strategies that could foster resilience across scales (Whitfield, Challinor, & Rees, 2018). This means that people must work, or at least think, across scales. They must recognize what each scale literally "brings to the table" and where their vulnerabilities are. These authors point out that we need platforms and suites of practices that will be adapted to scale and context, in part because the cross-scale and multi-sited nature of food systems presents multiple challenges (Whitfield et al., 2018). These arguments are diminished, if not lost, if local and regional scales are conflated.

A number of these challenges relate to the sustainable use of resources. Researchers in British Columbia (Kissinger, Sussmann, Dorward, & Mullinix, 2018) studied multiple biophysical

impacts of a local food system. They found that it was not necessarily more environmentally sustainable and therefore was "not as compelling an argument for food system localization" (Kissinger et al., 2018, p. 1). Comparable research at a regional level would be most welcome as there are few if any studies that address this.

Taking the Northeast as an example, droughts are projected to be more common in the future due to climate changes (Sweet, Wolfe, DeGaetano, & Benner, 2017) despite predictions of higher annual precipitation in the Northeast (Hristov et al., 2018). These anticipated dry spells will cause declines in crop yields and increases in crop losses (Sweet et al., 2017). Farmers also face challenges with regard to energy and may reduce energy risk through, for example, growing more of their own feed (Ciolkosz & Helsel, 2017). But these effects are site-specific across the region's 300 counties. This suggests that relying on a region that encompasses multiple latitudes to mitigate specific local effects is a sound strategy.

Climate change may exacerbate vulnerabilities, but it may also open up new opportunities for farming in the Northeast region (Wolfe et al., 2018). New research has modeled the effects of climate change on some commodities grown in the Northeast states over the next 50 years (Resop, Fleisher, Timlin, Mutiibwa, & Reddy, 2016). This research has also offered suggestions as to what adaptations farmers can make to maintain yields. Because these effects and adaptive strategies will vary across the region, it makes sense to think regionally in terms of overall food production.

Climate change, the decline and degeneration of natural resources, and other conditions constitute serious challenges to food system resilience (Lengnick, Miller, & Marten, 2015). As research has uncovered some of the drawbacks to the emphasis on local food, such as transportation inefficiencies (Lengnick et al., 2015), other research has offered new arguments in support of food system development at the regional scale (Clancy et al., 2017; Lengnick et al., 2015). The benefits of food system development at the regional scale include the contributions of multiple scales to strong resilience as mentioned above, as well as to increased biodiversity, food chain infrastructure, land conservation and access, farming opportunity, and culturally diverse products. Most papers leave scale undefined, and some draw fairly small-scale boundaries. But regional is not geographically hardwired; any acknowledgment or application of the regional framework is a good start.

Reimagining, and then operationalizing, food systems that can overcome these challenges require researchers and practitioners to connect the pieces of this complex social and ecological puzzle (Institute of Medicine & National Research Council, 2015; The Economics of Ecosystems and Biodiversity [TEEB], 2018) across scales and sectors. Siloed approaches, arbitrary boundaries, and loose definitions prevent us from identifying key linkages and from recognizing the present and potential unintended effects of food system decisions on farmers, other supply-chain members, consumers at all income levels, and the environment. Only systems approaches allow us to see the "why" and "how" of the integrated and interconnected spatial boundaries of policies and programs. This is clearly evidenced by climate, water, and energy, which do not stop at borders. Bringing systems thinking to bear helps people consider the relevant spatial and temporal boundaries and assess the impact of policy and program changes at more than one sector or scale.

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Examples in the U.S. and abroad showcase regional approaches to address food resilience. Lengnick, Miller, and Marten (2015) offer the cooperative food network in the Twin Cities area of Minnesota as an example of a mature, self-organizing regional food system. This cluster has overlapping and unique relationships with smaller

towns and cities in the Upper Midwest. These researchers offer the idea of a nationally integrated network of sustainable metropolitan food systems as a way to improve climate resilience and diversity.

In a similar vein, the City-Region Food System is progressing in Europe and Latin America (Blay-Palmer, Santini, Dubbeling, Renting, Taguchi, & Giordano, 2017). City-regions are defined as urban centers and their surrounding peri-urban and rural hinterlands. Participants see the approach as a way to integrate flows of resources and products across sectors and to develop relevant urban-rural policy frameworks.

Food Solutions New England is described as a "regional, collaborative network organized to support the emergence and continued viability of a New England food system that is a resilient driver of healthy food for all, racial equity, sustainable farming and fishing, and thriving communities" (Food Solutions New England, n.d., para. 1). Policy initiatives, farm to institution, professional and advocacy network, and a framing document called "50 x 60: A New England Food Vision" demonstrate a six-state commitment to thinking and acting regionally.

We feel that these are truly pressing issues—as the effects of climate change are appearing more quickly than originally predicted, and all regions are experiencing increasing land loss and food insecurity, among other negative impacts.

We think that:

1. Researchers and practitioners should bring a systems lens to their work and stop conflating the terms local and regional.
2. Activities and research at the local level should be applauded, supported, and encouraged to connect to larger contexts.
3. The importance and utility of geographic scales working together should be built into all food systems work.
4. We should apply the principles of resiliency to efforts at every level at which food systems actors engage.
5. Recognizing that regions have flexible boundaries should not hamper specific projects from delineating useful and relevant boundaries at larger-than-local scales.
6. All food system advocates should acknowledge the importance and relevance of work at multiple scales and seek to network across levels.

We welcome research, examples, and arguments that build on this concept of "thinking regionally."

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