

**DIGGING DEEPER***Bringing a systems approach to food systems***KATE CLANCY****Transdisciplinary and systems approaches to food security**

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I've been writing for several years now about the importance and usefulness of applying systems concepts to work in food systems. Several of my JAFSCD columns have offered highlights from different reports issued by the National Research Council (NRC, 2010) and from the Institute of Medicine and National Research Council (Institute of Medicine & NRC, 2015) which have strongly

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called out the need for transformative food and agriculture research (K. Clancy, 2013; 2016). In this column, I want to focus on a report funded by the W.K. Kellogg Foundation (WKKF) and released in May 2017 by the Association of Public and Land-Grant Universities (APLU), entitled *The Challenge of Change: Harnessing University Discovery, Engagement, and Learning to Achieve Food and Nutrition Security*. Although directed to public research universities, most of the analyses and recommendations apply just as well to private universities and other institutions of higher education that are tackling food security and insecurity at all levels.

Like the authors of the earlier documents, the close to 200 people who contributed to the food security report agree that long-term food security is among the top, if not the primary, challenges facing the world—and one of the most complex. They also agree with the earlier reports that transformative research, which studies systems changes that are very different from the present system, should be more strongly emphasized (NRC, 2010).

This kind of research requires the use of system structures and concepts—with a special emphasis on adaptability and resilience. Applying systems thinking requires the involvement of a wide range of experts from multiple disciplines to “unravel the complexity of interactions in the food system” (p. 5). The report draws on and calls attention to the comprehensive literature on topics related to these approaches published over the last two decades.

One of the distinguishing characteristics of the report is its strong emphasis on one of the core tenets of transdisciplinary research: “focusing on shared problems and the active input of practitioners” (Brandt et al., 2013, p. 1).

Its authors acknowledge that universities often don’t engage with their surrounding communities, which may include those most affected by food insecurity. This situation is exacerbated by the lack of diversity within universities that perpetuates inattention to low-income communities, as well as communities of color.

The development of the report was led by a commission of university leaders, food security experts, and private- and public-sector officials from the U.S., Canada, and Mexico. Over 100 people served on interdisciplinary working groups and as expert advisors. Another 75 organizations were contacted for their input. Seven working groups, ranging from increasing sustainable food production to knowledge and education, were formed. (I was a member of the nutrition, human development, and health group.) Their work fed into seven challenges that included creating and sharing resources that will serve all populations, ensuring inclusive and equitable food systems, and addressing the dual burden of undernutrition and obesity to ensure full human potential. Analyses and recommendations from the working groups were brought together in sections describing each challenge, and are illustrated with examples of ongoing interdisciplinary research and programs on food-security issues from universities, nonprofits, and corporations across North America. These are followed by a

section on how and why research universities must work with others to create longer-term solutions to complex food-security issues.

I want to elaborate here on the report’s recommendations for institutional transformation:

1. Public research universities (and others as I mentioned above) should elevate food and nutrition security to a top priority. The report points out that universities are uniquely equipped to respond to the obstacles impeding progress toward food and nutrition security because of their subject-matter expertise across disciplines, and their domestic and global experience. At this point, these institutions need to understand much better how factors causing food insecurity in the U.S. and globally, such as racism and poverty, interact with each other. And what they learn needs to be quickly translated into policy briefs that explain both the implications of the research and the implications of policy for public audiences. One of the charges to

the commission was to identify next steps on how to “enhance substantial government investment” to advance food and nutrition security. This can’t be accomplished without compelling arguments derived from research and experience, and also policy research that can identify unintended consequences of policies, winners and losers in policy debates, and benefits and costs of policy alternatives.

2. Significant changes are needed to accomplish this, leading to the second recommendation that university resources and structures for transdisciplinary approaches should be aligned. Most universities do not reward or acknowledge faculty members’ contributions to transdisciplinary research, so changes are needed in organizational structures, resource allocation, faculty incentives, and criteria for faculty promotion and tenure. The efforts to build inter- and trans-disciplinary structures and teams at

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some U.S. universities need to be taken up by many more institutions. These efforts, however, take time and resources, and the need comes just as U.S. federal and state agricultural research budgets continue to shrink (M. Clancy, Fuglie, & Heisey, 2016; Monke, 2016). My feeling is that new and much more creative efforts must be made to change the situation. These efforts should include the development of new strategies by groups of committed leaders (university presidents and deans), research scientists from the biophysical and social sciences, other stakeholders (including both nonprofit and for-profit organizations), and policymakers who recognize the importance of agricultural research and the straits in which it finds itself at present.

3. Institutions should enhance and build new university-community relationships. The authors state that this report represents a strong commitment to university engagement with external stakeholders as a “primary vehicle through which universities can realize impacts on food and nutrition security” (p. 19).

This translates into the challenge of making changes in university cultures, operations, funding relationships, and activities so that university teams actively interact with communities throughout the entire research process and commit to mutually beneficial engagements that include community ownership and leadership. Furthermore, populations affected by food insecurity, which includes women, youth, the poor, and marginalized groups, should be engaged in setting agendas and have access to research findings and other relevant information. Among other things, the report suggests that universities establish strong networks outside the agriculture and fishing communities, such as architects, urban planners, and energy scientists, as well as public

and private, profit and nonprofit entities in all sectors that cut across food, agriculture, and health. These strategies underscore the importance of revitalizing the influence of publicly funded research and increasing long-term interdisciplinary basic and applied research efforts. The present scheme of mainly short-term, project-based funding deprives community residents and the experts working alongside them “of autonomy, self-determination, and respect” (p. 74).

Furthermore, although many North American universities are located in areas where food insecurity is high, most of the faculty and students working on international nutrition

and food security in those institutions are disconnected from this more proximate problem. My observation over the past 25 years is that researchers who have worked overseas are much more likely to understand and employ systems approaches in their projects and courses. This expertise could be put to good use in domestic settings, thus enriching both local and global efforts.

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4. A new generation of students needs to be educated on how to solve transdisciplinary problems. In fact, the report states that this is “the most fundamental means to address the lack of systems-level understanding and critical thinking on global food security” (p. 115). This challenge requires, among other things, new curricula that balance the necessary disciplinary expertise with a strong interdisciplinary and transdisciplinary focus. Teachers should be aware of their role in training future policymakers and policy analysts who can work with scientists and stakeholders, including community organizations. They also should make their education and outreach efforts more connected to students’ needs, such as in some cases students’ own food insecurity, or in other

cases students' lack of exposure to and understanding of hunger.

The report argues that the problem of food and nutrition security is of a magnitude that demands making tough decisions and taking bold action. In fact, the report states that "refusing to act to address food insecurity *is* [emphasis added] a decision" (p. 111), which I believe should weigh on anyone working in the food and agricultural arena.

As I was completing this essay, I read about a book to be released in 2018 calling for a fundamental restructuring of land-grant universities, charging them with having abandoned their mission of serving the people in their states and regions (Wermund, 2017). The APLU report amplifies this charge and offers numerous ways by

which these universities can recover their proper and relevant role. They could start with a commitment to engage much more extensively with their communities on food security research and programs. They could also interpret research recommendations for practitioners and offer pathways for them to assist in developing new transdisciplinary projects with university and other partners, and to improve the activities and outcomes of present projects.

Faculty members, staff, and administrators should advocate for more funding for agricultural research as a whole, with a particular emphasis on systems research. Finally, institutions need more internal advocates and volunteers to develop strong interdisciplinary curricula and courses that expose undergraduate and graduate students to inter- and transdisciplinary concepts.



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