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Bringing a systems approach to food systems
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A different way to approach policy change

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A question I've been asked a number of times is: What are the most critical food policies that need to be changed or formulated to meet any number of different goals? My short answer to two such exchanges over the past couple of years have been, "I don't have a clue" and "There are too many to count." If you look at any comprehensive food system map (the one I like best is the Global Food System Map by shiftN (2009) at the Food + Tech Connect website; another good one is the Nourish food system map by WorldLink (2014) at the Nourish website), you'll see uncountable places where a policy or multiple policies are in play. This occurs at every level, from local to global. Some of the existing or recommended policies are supportive of a sustainable, resilient system — and many are not. Furthermore, and most importantly, many have never been examined well enough in a strategic, systemic way to be identified as useful or not.

It strikes me that it might be helpful to have some better tools to help people decide what policy change might be most appropriate in a particular situation — not just in terms of the politics of the thing, but in terms of optimizing the most variables. The global map shows, for example, that regional or national food security arises out of the intersection of many sectors: science, technology, politics, sociocultural phenomena, population, and education. The environment supports food production and other parts of supply chains, and economics plays the other key supportive role. The task is to examine those variables in terms of their significance for any particular policy proposal.

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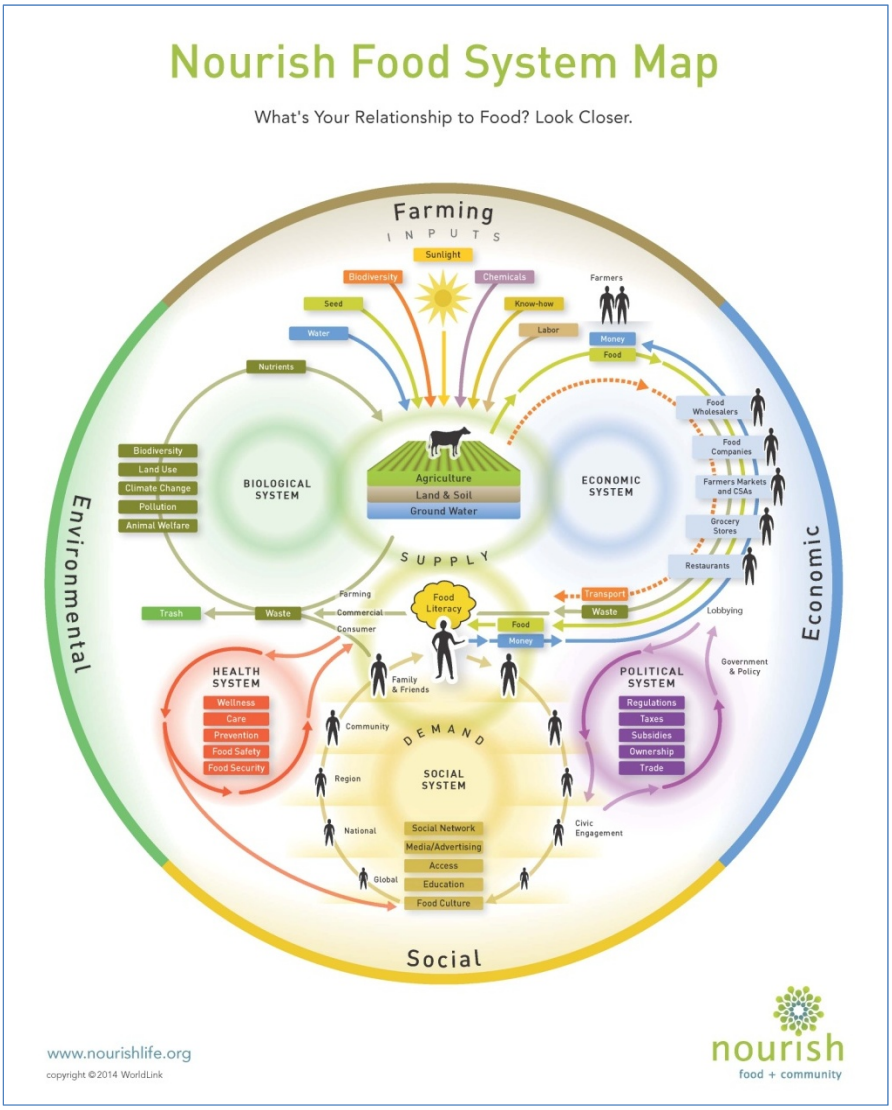
Developing policies that acknowledge the complexity of any system calls for a "comprehensive and integrated analytical approach" (Ericksen, 2008, p. 235). One of the systems concepts I've mentioned before that can be of use in being more strategic and informed about policy targets is complex adaptive systems (CAS). These systems consist of "many diverse and autonomous components or parts…which are interrelated, interdependent, linked through many (dense) interconnections, and behave as a unified whole in learning from experience and in adjusting (not just reacting) to changes in the environment" ("Complex Adaptive System (CAS)," n.d., para. 1). Such a system has a number of properties; one is *individuality,* referring to multiple decentralized actors who adapt their behavior individually. Take vegetable consumption as an example. Only a small percentage of people consumes the recommended level, with individuals offering different reasons for their avoidance — they don't like the taste, they're not easy to prepare, they're not convenient, they cost too much. Other actors are nutrition educators and researchers who try to figure out how to inspire consumers to eat more vegetables, and U.S. producers who export large volumes of vegetables, while wholesalers import about 25 percent of the total fresh vegetables eaten. These actors exist at different scales, and their actions continuously interact.

Another property of a complex adaptive system is *heterogeneity,* which means there is substantial diversity at each level of the system. For example, people and organizations have quite different values and motivations regarding their interest or disinterest in, say, organic or local food. And these goals may be in conflict, such as organic food being more environmentally benign but costing more. A good strategy is to look at a variety of drivers and decide on the most useful entry points for policy change, including recognizing how particular decision-makers make choices among possible outcomes of a policy decision (Ericksen, 2008). Ironically, a broad understanding of the bigger picture allows a project



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or intervention to be more closely targeted for the most impact (Hammond, 2009). For example, if policies regarding the sales of particular foods differ in adjoining states, what type of agreements might be constructed to allow better flow of food products across borders?

A third property of complex systems is *interdependence,* meaning that many pieces interact and connect across different levels through feedback loops. As described in my last column, we have to measure and be aware of cross-sector and cross-scale interactions, or at least be aware that there are links from a scale like regional to higher and lower levels. Ericksen admits that food system variability across scales often results in different outcomes, but goes on to say that understanding how these different policies reinforce or confound one another is a critical step in deciding on a policy strategy. The many connections among levels, scales, locations, and actors provide needed diversity and "strength through the preservation of options" (Newman & Dale, 2009, p. 13), such as in the case of drought in some, but not all, parts of the country where hay is produced, or the counter-seasonal phenomenon of trade in fresh produce.

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One of the ideas inside adaptive management is that a good conceptual framework allows for better decision-making, given the uncertainty and unpredictable outcomes expected with food systems issues (Ericksen, 2008). So, what are some of the steps in deciding which policies offer the best solutions to a particular problem? I offer a few here, which could be expanded to many other items.

1. Develop a framework or an organized approach that links the interactions of relevant factors and can guide decisions.
2. Because the best policies should arise out of governance that has sustainability and resilience as goals, define what sustainability and resilience mean in your particular policy scenario.
3. Become educated about the specific food system problem you are addressing at the deepest level possible within time and resource constraints, including the CAS properties mentioned above.
4. Always think across scales.
5. Develop indicators of intended and unintended change.
6. Conduct evaluations for feedback.

The more you know about a problem and consider where the best leverage point is, the greater your chances of success. Some more time spent on policy strategy is sure to be time well spent.

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