

## COMMENTARY

# Agency in resilient local food systems

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Submitted April 16, 2025 / Published online November 3, 2025

*Citation:* Worstell, J. (2025). Agency in resilient local food systems [Commentary]. *Journal of Agriculture, Food Systems, and Community Development*, 15(1), 117–122.  
<https://doi.org/10.5304/jafscd.2025.151.005>

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## Introduction

How can resilience of local food systems be strengthened? Inwood et al. (2025) recommend the CLIMATED framework (Worstell, 2020; Worstell & Green, 2017), because it emphasizes social infrastructure that is modularly connected, conservatively innovative, redundant, and embraces change. However, while this framework highlights self-organization, it fails to fully recognize that resilient local food systems in developing regions are invariably catalyzed by the emergence of entrepreneurial agency—a pattern I’ve observed from my experience with rural communities in the Delta (Arkansas, Mississippi, Louisiana, Missouri Bootheel, Western Kentucky and Western Tennessee), Appalachia (Eastern Kentucky, West Virginia and East Tennessee), and 41 developing countries. Might extant models of resilience underemphasize the urgency and purpose of agency (Burnett, 2023) in catalyzing resilience?

Biological agency is defined as a goal-directed capacity for self-organizing, active, and autonomous behavior (DiFrisco & Gawne, 2025). Biological agency has been found at multiple scales in living systems, and has been the subject of increasing attention in biology, as attested by the number of special issues and edited volumes devoted to the topic (e.g., Corning et al., 2023; Fábregas-Tejada et al., 2024; Mitchell, 2023; Moczek & Sultan, 2023; Moss, 2024; Švorcová, 2024; Vane-Wright & Corning, 2023).

Some iconoclasts have recognized the vital role of agency in the resilience of human systems. Budowle and Porter (2022) contended that agency is a crucial component of community resilience and improving health outcomes. Likewise, Brown and Westaway (2011) noted that “human agency is considered a key factor in determining how individuals and society respond to environmental change” (p. 321). Application to agriculture, however, is rare (Greene et al., 2022).

The impact of agency on resilience has been most thoroughly documented in response to natural disasters. For example, Airriess et al. (2008)

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chronicles the aftermath of the Hurricane Katrina in New Orleans, where Vietnamese Catholic church (VCC) leaders organized local community members and accomplished quick rebuilding, an effort that to most observers met the “build back better” criteria of resilient communities (Skerratt, 2013). The VCC was notably more effective and efficient than any other effort in New Orleans. The self-organization of agency (Nespeca et al., 2020) has repeatedly been shown to be central in mitigation of even the most horrible of disturbances, such as the COVID-19 response in Wuhan province in China (Tu, 2022). Efforts taken by non-local actors can disempower agency and therefore discourage resilience of systems at local levels as well as stimulate revolt by lower systems (Holling & Gunderson, 2002; Nassif, n.d.).

The recent multidisciplinary recognition of agency in biological systems compelled me to take

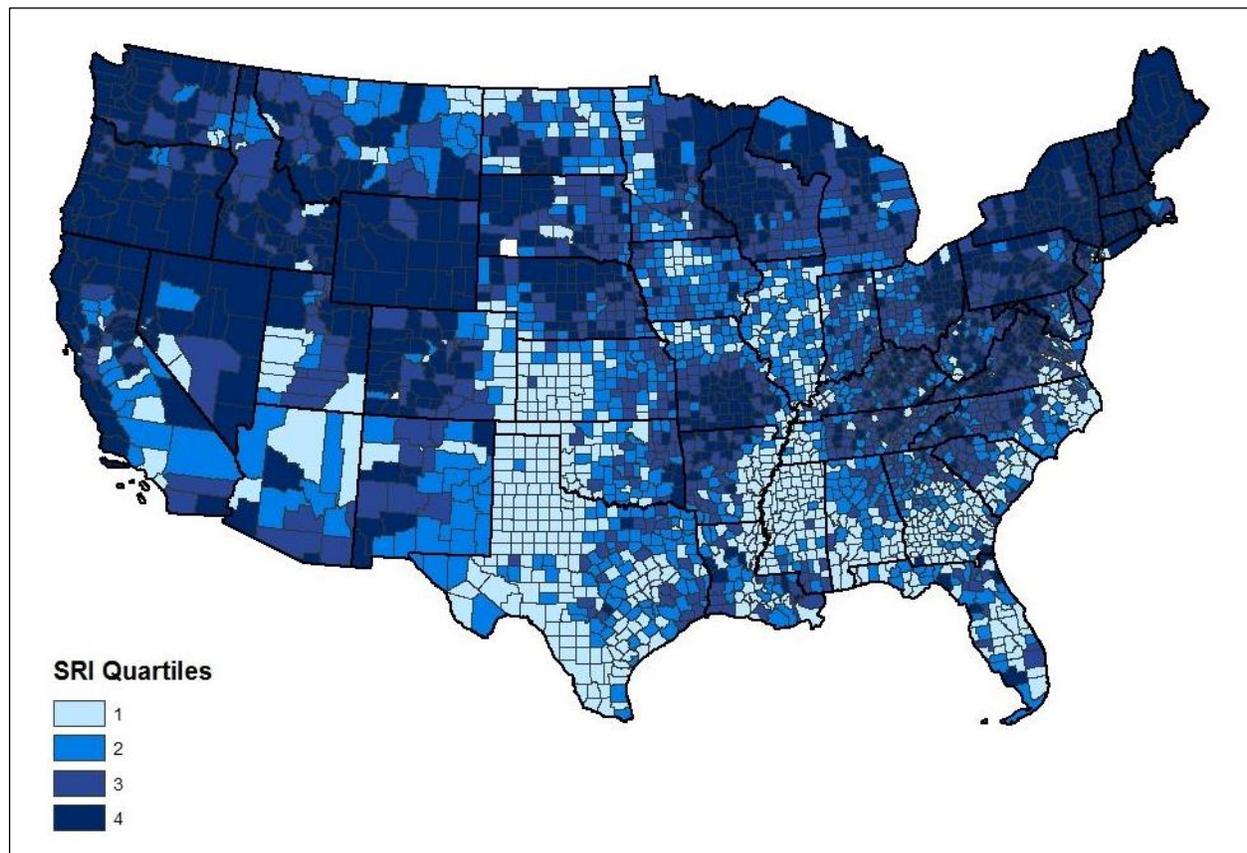
a new look at some old conundrums that emerged from work on the CLIMATED model:

1. The high correlation of resilience with low levels of poverty and high levels of health (Green et al., 2019, 2023) does not hold in Appalachia.
2. Highly resilient communities have arisen adjacent to communities with very low resilience (see Figure 1).
3. One area of the U.S. South has proven resilient to climate change, actually decreasing in average annual temperatures in recent years.

I investigated the interaction of agency and resilience in case studies of 31 resilient local foods systems that have been followed for a minimum of 10 years by Resilience Project (2025). Nine of these

### Figure 1. Resilience of U.S. Counties Using the Sustainability/Resilience Index (SRI) Scores

Lighter colored counties had low SRI scores; darker counties had higher SRI scores. The High Plains, Mississippi Delta, and Piedmont plateau stand out as generally low resilience regions, although exceptions are present.



cases helped formulate and refine the CLIMATED model of resilience (Worstell, 2017a). Worstell and Green (2017) used this model to develop a sustainability/resilience index (SRI) using quantitative measures available at the county level of the eight qualities of CLIMATED. While previous papers focused on the Southern region, Figure 1, for the first time, shows quartile rankings calculated for all counties in the continental U.S.

Resilience of food systems (as measured by SRI) was subsequently found to be highly correlated with low poverty and high health outcomes (Green et al., 2019, 2023). However, one region bucked this trend: Appalachia. To understand this anomaly, Resilience Project conducted a series of case studies in counties with low health outcomes, high levels of poverty, and high resilience. Reexamination of these 10 Eastern Kentucky case studies revealed two distinct populations in this region. Farming communities showed high levels of agency, high health outcomes, and low poverty, whereas in the more populous former mining communities, low levels of agency are present along with high poverty and poor health.

A second unexplained phenomena that emerged from these studies was counties with high resilience scores were surrounded by counties with low resilience scores. To understand why these specific counties were exceptionally resilient compared to their neighboring counties, we explored these counties through more case studies. The 21 cases examined included three in Arkansas, one in California, five in Louisiana, seven in Mississippi, three in Tennessee, and two in Texas.

Each highly resilient county seemed to show the type of self-organization called agency as defined by DiFrisco and Gawne (2025) and Greene et al. (2022). A few examples follow.

### **Agency in Local Food Systems**

Resilient agents often use the agency of other systems to build their own resilience. Many farmers recruit their marketing-savvy children to increase resilience of their systems, such as in the Chattanooga case (Nassif & Worstell, n.d.). Similarly, a 200-farmer fresh vegetable cooperative in Eastern Kentucky built a grading, packing, and cooling facility to use the agency of a long-established mar-

keting firm to yearly move 200 acres (81 hectares) of peppers and cucumbers (Grand, 2015).

In a California case study, a strawberry operation originally was a cooperative of migrant workers. However, after several tough years, the organizer realized that the workers were more interested in stable employment with full benefits and timely pay than in managing or marketing. So, the organizer reorganized the cooperative into a limited liability corporation (LLC) and took on management and marketing responsibilities themselves. Under the agency of the new manager, the business began to flourish (Worstell, 2016).

The entrepreneurial agency in the California strawberry case is similarly present in a local food system facilitated by an employee of Kentucky State University, who revived a mobile meat processing unit. Before the employee's involvement, the unit was abandoned, lying in a field rusting. The new agent was a rabbit producer who was working with other rabbit producers to provide lean, nutritious, high-quality meat to restaurants throughout central Kentucky. For him, the processing unit was more than just a service; it was a crucial component in an integrated production, processing, and marketing system. His agency in the system was the linchpin for its success (Johnson, n.d.).

At first glance, the dusty high plains of Texas appear unlikely to rate highly in local food system resilience. Yet the county containing Amarillo has an SRI score in the top 10%, while all other counties in the High Plains are in the lowest quartile. The reason becomes evident when listening to the residents: "People in Amarillo love local food and local businesses," and "The more local you are, the more Amarillo customers like you." Amarillo's supermarkets are dominated by locally owned companies that prioritize buying locally sourced food. National chain restaurants come and go, as locally owned restaurants serving locally grown food are much preferred by residents. Agency here is seen not only in the multiplicity of local entrepreneurs, but in the residents who chose to keep their dollars circulating locally to benefit the whole community (Worstell, 2017b).

A high resilience score in central Louisiana also reflects a strong presence of agency beyond agri-

culture. In Winn Parish, farmers produce vegetables using some of the most regenerative practices from the most progressive regions of the country (Worstell, 2017d). What is even more notable is the history of the parish. In the Civil War, Winn Parish was known as the Free State of Winn, and was the only Louisiana Parish to vote against secession, even welcoming young men who did not want to serve on the Confederate side.

Winn Parish is said to have only one crop in abundance: dissent (Hess, 1966). The Winn dissent reached an apogee in 1908 when residents broke from Southern thought to support the Socialist William V. Debs for. Among Debs' most ardent supporters was the father of Huey Pierce Long, Jr.—one of the most colorful, powerful, and controversial politicians in U.S. history. The influence of agency in national politics from Winn Parish echoes the impact on poverty and health in other counties with high SRIs (Worstell, 2017c).

Winn Parish is also one of two of our case study counties in the “climate anomaly” region spanning parts of Louisiana, Mississippi, and Arkansas. Instead of experiencing increasing average temperatures due to climate change, this region has decreased 1.2 degrees since 1958 (NSAC, 2019; Worstell, 2019). This shift has coincided with many

farmers virtually abandoned row crops for forestry, chickens, and intensive vegetable plots. The agency of farm managers moving away from row crops has created a much more resilient and climate-friendly agroecosystem.

Neshoba County, Mississippi, shares the high resilience, high agency, and climate anomaly of Winn Parish. It also provides insight into resilience and agency from a lady who married into Neshoba County: “In other counties, people didn’t adapt to change. When one big industry shut down here, people were resilient and wanted to stay here. If you get the mindset you’re gonna make it and gonna stay here and you’ll adapt and do other things” (Worstell, 2017e, para. 14).

### Invitation

Given my fervent belief that resilient food systems have agency, it is not surprising that I would find agency in all our 31 case studies of resilient local food systems. As biological agency gains increasing traction, I am hopeful that readers, especially those closer to beginning their careers and interested in increasing resilience of local food systems, will be moved to examine agency more systematically and quantitatively. 

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