

# Leaning into the AAAE Values: Theoretical Frameworks for Systems-Oriented Paradigms

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## Abstract

*The 2023 AAAE Values document identifies nine broad areas to focus research and practice to address complex agricultural, food, and natural resources challenges. To do this good work, we need paradigms, frameworks, and methodologies to guide our thinking, scholarship, and practice. Systems-oriented paradigms enable us to solve problems collectively, propose holistic solutions, and tackle challenges at their cause rather than their symptom. The purpose of this theoretical manuscript is to invite AAAE scholars and practitioners to engage with systems-oriented paradigms when addressing complex AFNR challenges and to offer a resource for researchers and practitioners investigating complexity in AFNR systems. To accomplish this, we share three theoretical frameworks as entry points into systems-oriented paradigms. This work has implications for research and broader implications for the practice of scholarship in our discipline.*

## Introduction

We live in an increasingly complex world where the more we understand, the more questions we likely have about how things work and how those workings fit together. Most of our efforts at science (social and otherwise) boil down to efforts to simplify the complex; to understand the chaotic rules governing the phenomena of our lives. These phenomena comprise interactions, which form relationships, shaping communities that encompass landscapes and ecosystems, and ultimately, systems. Each of these “levels” interacts with others, making every small phenomenon identified in the abstract both a critical and infinitesimally small piece of “the way things are.” An increasingly complex world demands that researchers make sense of the science beyond generating new understandings of the chaos.

In 2023, the American Association for Agricultural Education (AAAE) launched the AAAE Research Values document, intending to “serve as a guide for social science researchers by which complex problems in agriculture, food, and natural resource (AFNR) systems can be solved through cross-disciplinary, multidisciplinary, and interdisciplinary efforts” (AAAE, 2023, p. 5). The document includes nine values: 1) advancing public knowledge of AFNR systems, 2) enhancing environmental health, 3) ensuring diversity, equity, inclusion, and belonging, 4) examining social dynamics in human and life sciences, 5) fostering healthy living, 6) implementing programing for international development initiatives, 7) increasing prosperity through innovation in AFNR systems, 8) nurturing positive youth development

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through AFNR systems, and 9) promoting personal responsibility and safety in AFNR systems (AAAE, 2023). The Values document guides our focus, encourages us to confront complexity, and challenges us to address the wicked problems that plague our discipline and world. To do this good work, we need paradigms, frameworks, and methodologies to guide our thinking, scholarship, and practice.

### Embracing Complexity through Systems-Oriented Paradigms

“The difference between complicated and complex adaptive systems and problems is a difference of type, not degree” (Poli, 2013, p. 144).

To engage with complex problems, we must first understand the distinction between *complicated* and *complex*, as the methods and approaches for understanding and managing them differ significantly (Snowden & Boone, 2007; Poli, 2013). To that end, we need paradigms, frameworks, and methodologies to help us achieve this goal. *Complicated* problems require (often complicated) solutions. Van der Merwe et al. (2018) assert that approaches to complicated problem-solving break down phenomena into their most finite components and apply “methodologies aimed at predictability and control” (p. 3). These approaches presume the problem can be explored independently, outside its relationship to other problems or phenomena. In contrast, *complex* problems are dynamic, requiring iterative problem-solving and adaptation to address emerging problems that result from attempted interventions (Poli, 2013). Ripple effects from interventions often span multiple system levels (Gunderson et al., 2022), necessitating broad participation in problem-solving processes (Biggs et al., 2015; Wenger-Trayner & Wenger-Trayner, 2021). As many AFNR-related challenges are deeply contextual and composed of complex and complicated problems (van der Merwe et al., 2018), we have numerous opportunities for integrating complex thinking.

Systems-oriented paradigms have an epistemological orientation that enables us to address complexity by recognizing that the world is made up of interconnected, dynamic systems. We will use the term system-oriented paradigm as an umbrella term that incorporates approaches and theories that engage with complexity from a systems lens. Systems are “an interconnected set of elements that is coherently organized in a way that achieves something” (Meadows, 2008, p. 11). Systems are open, interconnected, and highly diverse, with many forces at play (Eoyang & Holladay, 2013). Systems-oriented paradigms reject reductionism and instead, emphasize relationships, connections, patterns, and context (Eoyang & Holladay, 2013). They are also grounded in systems thinking, complexity, and interdependence (Eoyang & Holladay, 2013; Tytel & Holladay, 2011). They assume that change is non-linear and the conditions creating challenges or situations comprise many interconnected parts that work unpredictably (Arnold & Wade, 2017). With a systems-oriented paradigm, one approaches systems and the desire to change systems from a stance of inquiry, encouraging individuals to approach systems with curiosity rather than control (Eoyang & Holladay, 2013). Systems-oriented paradigms include systems thinking, which is “the ability to understand these interconnections in such a way as to achieve a desired purpose” (Stroh, 2015, p. 16). Working from a systems-oriented paradigm situates challenges as opportunities to remain adaptive to changing conditions rather than something to be solved.

As academics, we have collided head-on with systems challenges and, to varying degrees, stumbled our way into systems-oriented paradigms. As scholars, we have played with systems concepts and, to our great delight, found them to be incredibly useful in answering research questions, understanding the contexts in which we work, and supporting students, colleagues, and industry partners. Much of our research and practice involves preparing and supporting the AFNR/School-Based Agricultural Education (SBAE) teacher workforce and in 2024, we concluded a paper saying, “We must make a turn to transform the system itself by asking difficult questions, aligning with a systems-oriented paradigm” (Haddad et al., 2023, p. 91). We offer this paper as a way of holding ourselves accountable to this claim and inviting our peers into the messy and fascinating world of systems thinking and practice.

## **Purpose Statement**

The purpose of this theoretical manuscript is twofold: (1) to invite AAAE scholars and practitioners to engage with systems-oriented paradigms when addressing complex AFNR challenges, and (2) to offer a resource for researchers and practitioners investigating complexity in AFNR systems.

In the next section, we present three theoretical approaches AAAE members could leverage to study AFNR complexity using systems-oriented paradigms: Social-Ecological Resilience (Holling, 1973), Human Systems Dynamics (Eoyang & Holladay, 2013), and Landscapes of Practice (Wenger-Trayner & Wenger-Trayner, 2014) and Systems Convening (Wenger-Trayner & Wenger-Trayner, 2021). For each of these entry points, we use our unique voices as authors and scholars with experience in AFNR systems, specifically School-Based Agricultural Education (SBAE), leadership education, and higher education, to share our journeys into systems-oriented paradigms. We end by inviting our colleagues to embrace complexity in pursuit of AAAE Values.

## **Applying a Systems-Oriented Paradigm**

We need lenses, or distinct ways of studying, for approaching our work and responding to the present (Bingham et al., 2024; Grant & Osanloo, 2014). These lenses, often operationalized as theoretical frameworks, guide how we frame problems, interpret data, and justify methodological choices, making them essential tools for meaning making in social science research (Creswell & Poth, 2018; Guba & Lincoln, 1994). This need acknowledges that the current situation results from previous efforts to address challenges, and both the challenge and solution require a continuous response as new situations arise.

Below, we offer three theoretical entry points, three abbreviated papers within this manuscript, each contributed by a different author. Each is presented in the first person and grounded in the contexts in which we teach and work: school-based agricultural education (SBAE), leadership education, and higher education. We share the stories that led us to these theories and reflect on their influence in our practice. We include personal anecdotes and autoethnographic vignettes not as side notes, but as intentional parts of our inquiry. These stories help us situate theory in real-world practice, show our reflexivity, and make systems-oriented paradigms feel more approachable. We know from experience that systems work can feel abstract or overwhelming, and we've found that stories often help bring clarity and connection. As others have noted, personal narrative can be a powerful tool for meaning making in social science research and can deepen theoretical engagement in ways that are rigorous, relevant, and human (Ellis et al., 2011; Jones et al., 2016; Richardson, 2000). Through these entries, we aim to highlight the distinct yet overlapping values embedded in each framework and offer applications for both research and practice. In a later section, we zoom out to explore how these entry points might support inquiry into other topics across the AFNR landscape.

## **Entry Point One - Social-Ecological Resilience Theory**

“And don't make the mistake of calling us resilient. To not have been destroyed, to not have given up, to have survived, is no badge of honor” (Orange, 2018, p. 137).

My research interests began near the end of my undergraduate degree program when a mentor encouraged me to research soil science. I loved making observations, asking questions, and experimenting to find answers. When I began, I did not expect the emergence of new questions with each answer. This phenomenon did not cease when I started asking questions about teaching and learning. Instead, new observations, questions, and connections grew profoundly. Why does this career development event (CDE) consist only of a written exam and identification components? Could it be related to the resources the hosts need to manage to engage in more high-order thinking? What impact does this have on engagement in this event? How might it impact students' understanding of this portion of the industry? Are they getting more

hands-on experience in the classroom? If not, how does this affect students pursuing a career in this industry? What implications does this have for the industry itself? Are FFA CDEs important enough to have an impact on industry? What makes me immediately assume they are?

Similar to the process described in the introduction, the more I learned (and continue to learn) about SBAE, the more I realized how complex and interconnected the system really is. I found myself drawn to systems-oriented paradigms, and near the end of my master's program, I discovered Social Ecological Resilience (SER) through a course offering (Holling, 1973). As I engaged with the course materials, I could not help but draw connections between the SER concepts and SBAE observations and challenges. It was like a flashlight turned on, illuminating the spider's web of connections I was entangled in. The complexity, interconnections, and concepts I struggled to name finally began to make sense and unravel.

### ***Situating Social-Ecological Resilience***

“Stop calling me resilient. I'm not resilient. Because every time you say, ‘Oh, they're resilient,’ you can do something else to me” (Washington, 2010; as cited in Klein, 2014, p. 419).

Different disciplines have varied concepts and applications of resilience (Brown, 2016). In education, for example, scholars use organizational resilience to explore how school systems navigate change and distress (McLeod & Dulsky, 2021; Shaya et al., 2023) while others use individual or psychological resilience to explore how teachers (Gu & Day, 2007; 2013; Schussler et al., 2018; Virella, 2024) and students (Morales, 2014; Rudd et al., 2021; Ye et al., 2021) cope with adversity and persist. In SBAE, most research uses the individual resilience lens (Bowling & Thieman, 2020; Easterly & Myers, 2018; Jacobsen et al., 2024).

From these perspectives, I was a resilient teacher. I provided for my students, finding strength in their energy and passions when I had little myself, drained by overwhelm and overwork. I adapted my professional and personal schedule to pick up an engineering class mid-year when the original teacher left unexpectedly, and no one else was qualified to teach it. I even problem-solved to make a National FFA Convention trip happen for one competing student amid a global pandemic, despite negotiations with my administration, who seemed ready to veto the opportunity at any moment. I was resilient, but I was not thriving. Traditional perspectives on resilience assert it is a positive characteristic (Gu & Day, 2007; 2013), but what if a teacher's resilience, like mine, keeps her in an undesirable situation? Individual and organizational resilience are useful frameworks for supporting the persistence of teachers, students, and school systems in the face of strain imposed upon them; however, these frameworks often overlook the influence of the circumstances surrounding them and the agency of these actors to change the situation altogether (Haddad et al., 2023). This requires a systems perspective.

Social-Ecological Resilience (SER) is a concept born of systems thinking. Founded in the field of ecology, SER thinking helped foundational scholars explore the dynamics of how ecosystems persist in the face of disturbances (Holling, 1973). As scholarship advanced, patterns of adaptation and cross-scale interactions (i.e., relationships and impacts between different components of a system) emerged, along with the recognition of inextricably intertwined social and ecological systems (Folke et al., 2010). This section will primarily explore patterns of adaptation and cross-scale interactions as they contribute to the articulation of resilient *systems*. Today, SER thinking is also applied in various other disciplines (Folke et al., 2021; Gunderson et al., 2022), ranging from supply chain management (Statsenko et al., 2024) to healthcare (Garine-Wichatitsky et al., 2020) and beyond. Members of this author team have also brought SER thinking to SBAE to explore systemic challenges to teacher boundary setting (Haddad et al., 2023) and opportunities to strengthen social-ecological research and practice in the agriculture, food, and natural resources social sciences (Pauley et al., 2019).

### ***Systems, Scales, and Change***

Core ideas of SER portray the dynamic nature of systems while emphasizing opportunities to strengthen a system's ability to navigate change. Importantly, SER embraces the notion of constant evolution at multiple scales at any given time (Folke et al., 2010; Gunderson et al., 2022). These cross-scale interactions comprise the non-linear nature of complex dynamics within a system (Gunderson et al., 2022). Nonlinearity and complexity create effects across scales that are only visible when considering the entire system, rather than just a single process (Gunderson et al., 2022).

With numerous scales and sources of influence across a large system, SER scholars distinguish between two aspects of resilience: specified and general resilience. *Specified resilience* is “the resilience of some specified part of the system to a specific shock” (Walker & Salt, 2012, p. 18). For example, a community may be interested in supporting the resilience of their local agriculture program. To demonstrate their support, local community groups may focus on securing additional financial resources to support the program in the event of a reduction in crucial funding. The stakeholders, in this example, increase the specified resilience of the local agriculture program to financial shocks. However, these efforts may negatively impact the program in the long term if the school realizes that local stakeholders and businesses will support the program and the administration permanently reduces the program's budget line. For this reason, systems also require *general resilience*, or “the capacity of a system that allows it to absorb disturbances of all kinds... so that all parts of the system keep functioning as they have in the past” (Walker & Salt, 2012, p. 18). In other words, in addition to managing specific aspects of a system, understanding and managing how the specific components interconnect supports the resilience of the entire system.

Building a system's resilience can seem like a daunting task. After all, how does one simultaneously see how all the different components are interconnected, while managing the change of specific system components and larger complex systems? Through their work across various social-ecological systems, SER scholars identified seven key principles that build resilience, (1) maintain diversity and redundancy, (2) manage connectivity, (3) manage slow variables and feedbacks, (4) foster complex adaptive systems thinking, (5) encourage learning, (6) broaden participation, and (7) promote polycentric governance systems (Biggs et al., 2015). In Pauley et al. (2019), we have explored many SBAE applications of these principles.

### ***Benefits of SER Thinking in SBAE Systems***

Social-ecological resilience thinking not only accounts for different perspectives on resilience but also offers entry points for using the natural dynamics of systems to create more desirable outcomes. Change is inevitable. However, with a SER lens, we can better understand the signals for an approaching tipping point that could either force or support change. When we see these signals, we can be proactive, using the natural rhythm of change to reinforce the status quo or reorganize and try a different approach. Change within a system does not occur in isolation, but rather across various scales of the system. In SBAE for example, agriculture teachers face mounting professional demands, often reaching a tipping point. They adapt by setting boundaries, changing schools, or leaving the profession entirely. This turnover increases strain on broader system scales, such as local schools and teacher preparation programs. At the same time, state and national SBAE support teams work to maintain relevance and resilience by updating curriculum standards and expanding student engagement opportunities. However, while these efforts strengthen the system overall, they also reduce SBAE's specific resilience to the loss of highly qualified teachers.

Such examples of trade-offs between specific and general resilience at different scales are abundant in SBAE and other complex systems. These trade-offs must be managed as “channeling all your efforts into one kind of resilience will reduce resilience in other ways” (Walker & Salt, 2012, p. 19). We are not suggesting that focusing on a specific phenomenon in a complex adaptive system like SBAE is wrong. We

are asserting a need for SBAE scholars and stakeholders to view our system with both specific and complex lenses to help make agricultural education a system that allows its members to thrive.

### ***Additional Considerations***

One other core element of SER is the inherent integration of social-ecological systems. Though SER thinking has expanded from ecology to several fields, including many social sciences (Folke et al., 2021; Gunderson et al., 2022), the scholarship base is grounded in interactions between humans and the environment (Biggs et al., 2021). Situated at the nexus of social and environmental issues, SBAE is a component of both systems, and its outcomes inherently create impacts on both (Pauley et al., 2019). The examples provided exploring SBAE from an SER lens in these sections are predominantly focused on the social system of SBAE. However, we could just as easily apply our SER lens to cross-scale interactions between SBAE and the environment. From personal observations and experience, this relationship is often under-emphasized in decision-making processes in SBAE. As a pre-service educator, I successfully completed the required agriculture content courses for my degree program but did not give much consideration to the content and skills I chose to include in my in-service courses beyond what would address the content standards and be most relevant to the students in my community. Most of the time, this meant focusing on the basics. I did hands-on activities with my students. They loved it, and so did I. But the amount of time and energy these lessons required limited the emphasis I could place on connections between decision-making, agricultural practices, and implications for society and the environment. I know I made a positive impact on my students. Did I make one on the environments they will engage with?

### **Entry Point Two - Human Systems Dynamics**

While my undergraduate degree prepared me for SBAE, my educational journey led me down an adjacent path within the professional landscape of practice, leadership education and development. Earning my professional degrees in agricultural education and leadership at land-grant institutions, I was trained to be a teacher of teachers, with a focus on the intersections between leadership pedagogy and practice. As a leadership studies faculty member in higher education, I faced numerous competing pressures: developing a scholarly reputation, staying relevant in my teaching, serving as a research mentor, advancing new programs, engaging in meaningful community work, and eventually taking on administrative duties. Working in an interdisciplinary space, I found that the implicit rules of traditional faculty and departments did not always fit my context or felt like constraints on opportunities to innovate. This left me with many questions, often looking for guidance on whether I was doing the “right” things to advance on the tenure track. I was approaching higher education as if it were a *finite game* - something to be won. However, it was really what Carse (2011) describes as an *infinite game*, where the goal is to keep playing. Success is achieved through fostering relationships and promoting continuous learning, collaboration, and resilience. It would take time for me to shift from this static and linear view of my career toward a dynamic, systems-oriented view.

I found my way into the work of the Human Systems Dynamics Institute just before the onset of the COVID-19 pandemic. I was excited by the vision, “People everywhere thrive because we see patterns clearly, seek to understand, and act with courage to transform turbulence and uncertainty into possibility for all” (HSD, n.d.). My introduction was a two-day “adaptive action lab” - a virtual workshop that provided numerous “aha” moments as I found language and tools to untangle complex challenges in my work and life, developed my skills in inquiry, and generated options for wise action to navigate complexity. Little did I know that just months later, the pandemic would provide a very real practice field for deploying these new ways of thinking, being, and doing, as a faculty member and as a human navigating months into years of unprecedented circumstances. As I became a more active member of the community of scholars and practitioners comprising the HSD community, I have been able to incorporate human systems dynamics into my work as an educator, administrator, and researcher.

Human systems dynamics originated in the mid-1900s from foundational ideas developed by Dr. Glenda Eoyang, who applied systems thinking and complexity science to organizational change (Olson & Eoyang, 2001). Human Systems Dynamics (HSD) is a field of study and practice, described as a “dynamical theory” that co-evolves with a network of practitioners committed to using its principles and tools to make progress on complex challenges (Eoyang & Holladay, 2013, p. 120). Sharing many assumptions with the other two theoretical entry points, HSD is applied in fields of practice like evaluation (Eoyang, 2006; Eoyang & Oakden, 2016;), teaching and learning (Patterson et al., 2012), organizations (Eoyang & Holladay, 2013), healthcare leadership (Menin et al., 2020), and family systems (Patterson & Holladay, 2024). Below, I will focus on principle tools used within systems convening to build resilience, specifically Complex Adaptive Systems (CAS), self-organization, and adaptive action.

A complex adaptive system (CAS) is characterized by a network of individual parts interacting with one another, resulting in system-wide patterns that emerge over time (Dooley, 1997; Eoyang and Holladay, 2013). *Complex* means the parts of the system are connected and interact in interdependent ways. One part cannot be separated or changed without influencing other parts in multiple, unpredictable ways (Tytel & Holladay, 2011). This dynamic leads to conditions of uncertainty. As levels of uncertainty increase, the need for adaptability increases. *Adaptive* means a system has the capacity to change, react, or adjust in response to internal or external changes in the system’s environment (Tytel & Holladay, 2011, p. 24).

HSD categorizes system conditions as CD&Es - containers, differences, and exchanges. *Containers* include the physical, social, and psychological boundaries holding the system together. For example, this could be shared belief systems, organizational policies, a particular meeting space, or regional affiliation. *Differences* refer to the various ways in which the parts of the system differ; for example, differences in roles, training, personality, or cultural backgrounds. Differences create tension in the system, and tensions are not inherently bad as they prompt adaptation. Because there can be many differences, it is useful for practitioners to narrow in on those differences that have the most significant impact or create the most tension. *Exchanges* include the various forms of connection and interactions within the system. How information is shared and with whom are examples of exchanges. CD&Es shape patterns in the system. System patterns encompass similarities, differences, and relationships that hold meaning across space and time (Tytel & Holladay, 2011). Patterns can reveal how people or groups respond to specific circumstances, uncover hidden dynamics, and highlight areas for intervention. Over time, dominant patterns form the culture of the system, strongly influencing ongoing ways of thinking, doing, and being (Eoyang & Holladay, 2013).

Complex adaptive systems are naturally self-organizing, meaning parts of the system continually respond to environmental influences to adjust or find a better fit within the system's context (Eoyang & Holladay, 2013). From an HSD lens, fitness is described as *coherence* or finding balance in the system between similarities and differences to achieve desired patterns or outcomes. As one or more parts of a system change, conditions can shift across the entire system, prompting further adaptations. As previously noted, differences create tension; releasing accumulated tension, either by leveraging positive tensions and managing them, or decreasing negative tensions, shifts conditions in the system, resulting in a greater sense of stability (for the moment) with the potential to change resulting patterns. (Eoyang & Holladay, 2013; Patterson et al., 2012).

This process is ongoing; in human systems, emerging patterns influence the ongoing behavior of individuals within the system (Eoyang & Holladay, 2013). Due to this dynamic, no single person is solely responsible for directing change. However, people within the system can create conditions for effective self-organization, allowing solutions to emerge. The ability to recognize patterns is a starting point for influencing change. Then, change agents must work to make meaning of the patterns in the past, present, and future context. From there, they can intentionally alter the conditions that influence these patterns. Returning to CD&Es, an intentional action may involve changing the container, leveraging a significant

difference, or identifying new ways of connecting and sharing information. It is essential to observe what new patterns emerge and continue to repeat the cycle (Eoyang & Holladay, 2013). This change process is referred to in HSD as the adaptive action cycle.

*Adaptive action* is a powerful tool central to navigating uncertainty and change. It is a cycle of inquiry guided by three simple questions: *What? So What? and Now What?*—which guides people to understand the current state, interpret its implications, and choose practical next steps (Eoyang & Holladay, 2013). Considering this as a process, the question “What?” invites individuals and groups to collect data and information, identify patterns, and recognize conditions (CD&Es). Then, “So what?” invites consideration of the meanings of those patterns through reflection, dialogue, and discussion. At this stage, we consider the patterns we would like to see and explore the options that could help us achieve them. Because a complex system is not linear, there is never a “right” answer to a problem. “Now what?” prompts the selection and implementation of an action in the spirit of experimentation and learning (Menin, 2020).

As environments change, a system’s resilience is in its capacity to respond using adaptive action (Patterson & Holladay, 2024). There are numerous applications for HSD to support resilience across all levels of the SBAE system. For example, HSD’s emphasis on recognizing patterns can help SBAE programs identify trends and shifts in students’ learning needs, local agricultural practices, and community expectations. This recognition of patterns prompts an understanding of how culture is shaped and how patterns can be shifted. The adaptive action cycle—*What? So what? Now what?*—can be a powerful tool for SBAE teachers and administrators (as well as teacher educators and community educators), as they continually evolve their curriculum and approaches to stay relevant to changing educational conditions. Building adaptive capacity in system stakeholders can have a ripple effect, as we prepare resilient and adaptable learners for work in industries, communities, and families who can navigate an uncertain and changing world.

### **Entry Point Three - Landscapes of Practice and Systems Convening**

#### ***Traversing the Landscape***

I began my scholarly journey in 2016, amidst significant life changes. Leaving the secondary classroom to pursue a doctorate and spending a transformative year in Ghana taught me to use research to solve problems. Early on, I sensed a problem I could not quite articulate: there was something unarticulated about the state of SBAE teaching and the SBAE teacher workforce. For years, I had heard whispers about the “teacher shortage”—rumors that SBAE teachers rarely lasted more than five years, that half of their marriages ended in divorce, and that SBAE “wasn’t what it used to be.” Diving into the literature initially left me unsatisfied, not because of what was studied or written about, but rather because of what was not. I learned a great deal from scholars who invested deeply in strengthening the teaching workforce, enhancing professional development, and refining teacher preparation programs. Yet, something felt off. It seemed like we, as scholars, were not truly engaging with one another’s work beyond obligatory citations. I could not shake the feeling that we were skimming the surface of deeper, systemic issues.

While our research discussed teacher shortages, attrition, turnover, and professional development, these were merely symptoms of a larger, unnamed problem. Two things stood out: we had not identified the core issue, and the discourse around SBAE teachers was often framed from a deficit perspective—essentially, “fix the teacher, fix the problem.” Initially, I was unsure how to respond to this realization or how to transform it into something useful for moving forward as a researcher. The answer emerged during a Learning Theory class, where I encountered the theoretical concepts of Communities of Practice (Wenger, 1998). Suddenly, I had a framework—a way to explore how SBAE teachers strive to achieve success and balance their work and life. I have since explored these ideas with colleagues in workshops, conference

presentations, and publications (Claflin et al., 2022; Haddad et al., 2023; Haddad et al., 2024; Traini et al., 2019; Traini et al., 2020; Traini et al., 2021a; Traini et al., 2021b).

Interestingly, my lightbulb moment did not result from generating new knowledge from methodology. Rather, it stemmed from having a framework to make meaning of my experience as an SBAE teacher. It was the feeling of finally having words to describe experiences. It made those experiences more... real. This insight aligns closely with the purpose of learning theories like Communities of Practice (CoP) and Landscapes of Practice (LoP). Like many social science theories, these provide a framework to see the world anew (Wenger-Trayner, 2013). Wenger-Trayner and Wenger-Trayner (2014) remind us that such a theory “tells us what to pay attention to, what difficulties to expect, and how to approach problems” (p. 9). This approach is particularly powerful because it centers human learning while elevating the systems in which humans work and live. It acknowledges the messiness of navigating living and working spaces and everything that comes with them.

### ***Communities of Practice, Landscapes of Practice, and Systems Convening***

*Communities of Practice (CoP)*, *Landscapes of Practice (LoP)*, and *Systems Convening* represent three generations of theory predominantly developed by Etienne Wenger-Trayner. Over the past three decades, these ideas have evolved from a foundation in theories of identity, practice, social structure, and situated experience (Wenger, 1998), positioning human learning within complex, multifaceted social systems. At its core, CoP views learning as a process of social participation rooted in lived experiences and engagement with the world (Wenger, 1998). Learning is a social phenomenon, and, as social creatures, our knowledge, participation, and sense of belonging (our identity) are shaped by competence in the activities and ideas we collectively value within a community (Wenger, 1988). However, we rarely operate within a single, isolated CoP. *Landscapes of Practice (LoP)* evolved to address the complex, overlapping phenomena and identities across multiple CoPs (Wenger-Trayner & Wenger-Trayner, 2014). LoP considers how interconnected communities interact within broader landscapes. The emphasis is not on evaluating an individual’s actions as right or wrong but on understanding the realities of navigating a particular community or landscape. It considers the complexity of actors within the system, the historical and normative forces, reifications, and practices shaping the evolution of CoPs and LoPs and our participation in them (Wenger-Trayner & Wenger-Trayner, 2014).

*Systems convening* is a practice that allows us to leverage the social nature of learning in a landscape of practices to create real change. Systems convening allows scholars and practitioners to search for root causes rather than merely addressing the symptoms of systemic issues—an approach that facilitates shared understanding and collaboration (Wenger-Trayner & Wenger-Trayner, 2021). Convening work begins by creating space for the experiences of those who work within the system of interest and have a stake in meaningful and sustainable change. Systems conveners bring together people from different contexts, help them navigate complex social landscapes, and work within changing circumstances (Wenger-Trayner & Wenger-Trayner, 2021). Together, people across the system illuminate unrealized potential and “seek to reconfigure social systems through partnerships that exploit mutual learning needs, possible synergies, various kinds of relationships, and common goals across traditional boundaries” (Wenger-Trayner & Wenger-Trayner, 2014, p. 100). This approach diverges from typical methods that involve top-down initiatives, legislation, coercion, protest, or government mandates as the primary steps to transformation (Wenger-Trayner & Wenger-Trayner, 2021).

System conveners intentionally design interactions and experiences to foster relatedness, accountability, engagement, and commitment. As social architects, systems conveners aim to achieve three key objectives. First, they create spaces that nurture conversations about current challenges and alternative futures. For example, they may create spaces that convene around a particular question, such as “What if SBAE teachers had the time and mental energy to meet the needs of all their learners?,” or “Could there be

a future of SBAE that clung less tightly to the three-component model?” These conversations emphasize generosity, commitment, and accountability. Second, conversations work to shift people’s experiences. This principle enables us to consider how we facilitate access to each other’s experiences within the system, recognizing an individual’s experience as just that, and utilizing systemic structures as tools to be worked with rather than for. Third, leaders must listen, pay attention, and be prepared to say, *‘I don’t know’* (Block, 2018).

Convening, ultimately, is a call to accountability and commitment, meaning we must gather with shared ownership in mind (Wenger-Trayner & Wenger-Trayner, 2021). Systems convening acknowledges the need for actors across the social landscape to come together and identify leverage points for intervention (Wenger-Trayner & Wenger-Trayner, 2021). It is no wonder my introduction to social learning theory yielded equal relief and excitement; I now had a framework to untangle the complexities I had experienced, witnessed, and read about regarding SBAE. I had an entry point to guide my thinking and scholarship moving forward.

### ***Cross-applying theories as a move toward systems-oriented paradigms***

My journey across the SBAE landscape has been anything but linear. Yet, CoP, LoP, and Systems Convening have proven invaluable in grappling with the questions I had as a graduate student and continue to grapple with today. This theoretical evolution reflects an increasing complexity in human systems, with systems convening offering the transformative potential to tackle emergent challenges through collaborative action across landscapes (Wenger-Trayner & Wenger-Trayner, 2021).

While CoP, LoP, and Systems Convening are not systems thinking theories in and of themselves, they align with systems thinking principles and offer constructs that can be “run through” systems thinking frameworks. Before LoP and Systems Convening, Wenger-Trayner (2013) described CoPs as simple social systems and suggested complex social systems were constituted of interrelated CoPs (i.e., landscapes of practice). This description aligns with Meadows’ (2008) definition of a system as “an interconnected set of elements that is coherently organized in a way that achieves something” (p. 12). Wenger-Trayner & Wenger-Trayner (2014) position systems conveners as individuals who forge new learning partnerships across complex landscapes. This concept reflects a systems thinking approach, as it involves understanding and navigating the interconnections and dynamics within and between various CoPs.

Understanding human learning within a social landscape (i.e., system), using CoP, LoP, and Systems Convening, can become even more powerful when paired with broad systems thinking frameworks and approaches. We know theories are created for different purposes and offer varying degrees of usefulness depending on the phenomena under investigation. Sometimes, it is helpful to cross-apply theories, piecing together theoretical concepts to explore specific phenomena or answer particular research questions (Wenger-Trayner, 2013). Of course, doing so requires caution. Theories must be compatible, and contradictions in their ontological and epistemological underpinnings must be carefully navigated and reconciled to maintain epistemological integrity (Grant & Osanloo, 2014; Wenger-Trayner, 2013).

I’ll conclude this section with an example. My colleagues and I have explored how SBAE teachers navigate multiple CoPs, each with distinct stakeholders, expectations, and definitions of success (Traini et al., 2021a; Traini et al., 2021b). This navigation poses challenges due to the volume and diversity of tasks, as well as the identity work required to reconcile competing demands. Balancing these often necessitates long hours, personal sacrifice, and constant negotiation. Without theories addressing human interactions, social dynamics, and complexity, one might hastily conclude that stress management workshops, time management resources, or additional teacher preparation coursework would adequately address these challenges. However, theories that embrace complexity led to different conclusions and more questions.

Using LoP, we can examine the communities within the SBAE landscape, the histories and norms shaping the current reality, how SBAE teachers are welcomed or feel a sense of belonging (Traini et al., 2020; Traini et al., 2021a; Claflin et al., 2022), and how behaviors are validated or rewarded. Systems-oriented paradigms encourage us to examine the structural drivers of behavior, the consequences of activities, emerging trends, and the interconnected nature of cause-and-effect relationships within the system (Waters Center for Systems Thinking, n.d.). These perspectives challenge us to move beyond quick fixes and identify systemic leverage points that address root problems. As scholars and practitioners, these lenses guide us in formulating research questions, interpreting data, and designing sustainable interventions that acknowledge the complexity of the issues.

**Applying Theory to Broader AFNR Topics in the AAAE Values**

Up to this point, we have distinguished between complicated and complex problems, introduced systems-oriented paradigms, and explored three theoretical entry points into those paradigms. While our discussion has been grounded primarily in the contexts of school-based agricultural education (SBAE), leadership education, and higher education, systems we know well, these paradigms are not confined to those spaces. The theories we've highlighted, along with their associated constructs and practices, can be applied across a much broader range of topics within the agriculture, food, and natural resources (AFNR) landscape.

With that in mind, we offer the table below (see Table 1) as a set of example questions for research and practice that apply Social-Ecological Resilience (SER), Human Systems Dynamics (HSD), and Landscapes of Practice (LoP)/Systems Convening to additional areas of relevance for AAAE members and others seeking alignment with the AAAE Values. This list is not meant to be comprehensive; rather, we hope it sparks ideas and invites adaptation as readers consider how these paradigms might inform their own work.

**Table 1**

*Crosswalks of Three Theories with AAAE Values and Potential Research and Practitioner Questions*

Framework	Questions to Guide Research	Questions to Guide Practice
Socio-Ecological Resilience Theory	<p>How does the application of behavioral change theories in AFNR contexts influence the resilience of social-ecological systems, particularly in promoting sustainable individual and collective behaviors? <i>(Promoting personal responsibility and safety in AFNR systems)</i></p> <p>How do youth develop adaptive capacity in response to feedback loops within their social-ecological environments, and how does this capacity shape their decisions around career readiness, AFNR safety, and mental and physical health? <i>(Fostering healthy living)</i></p>	<p>How do AFNR programs cultivate both general resilience and specific resilience in youth career and leadership development across diverse socio-ecological contexts? <i>(Advancing public knowledge in AFNR systems)</i></p> <p>How can we design leadership and organizational development efforts in AFNR systems that strengthen both general and specific resilience, enabling individuals and institutions to adapt to change, recover from disruptions, and transform when needed? <i>(Advancing public knowledge in AFNR systems)</i></p>

Framework	Questions to Guide Research	Questions to Guide Practice
Human Systems Dynamics	<p>What containers, differences, and exchanges are shaping patterns of rural community vitality, and how do these dynamics influence adaptive capacity within these communities? <i>(Fostering healthy living)</i></p> <p>In what ways does pattern logic reveal the emergent dynamics influencing the applicability and integration of digital science within AFNR initiatives? <i>(Increasing prosperity through innovation in AFNR systems)</i></p>	<p>How can the adaptive action framework guide the development and evaluation of delivery strategies for global AFNR programming in complex and evolving contexts? <i>(Implementing programming for international development initiatives)</i></p> <p>How can pattern logic be used to examine the applicability and use of digital science tools in AFNR initiatives across diverse and evolving contexts? <i>(Increasing prosperity through innovation in AFNR systems)</i></p>
Landscapes of Practice/Systems Convening	<p>From a social learning perspective, what factors contribute to the decline in male participation in SBAE and FFA, as well as the decrease in male SBAE teachers? <i>(Ensuring diversity, equity, inclusion, and belonging)</i></p> <p>How do secondary SBAE teachers engage in professional development across multiple communities within a landscape of practice, and how does this engagement influence their professional identity and instructional practices? <i>(Ensuring diversity, equity, inclusion, and belonging)</i></p> <p>How do practitioners across diverse communities of practice within the agricultural landscape engage with, share, and adapt knowledge in response to climate variability and its impacts on agricultural practices and livelihoods? <i>(Enhancing environmental health)</i></p>	<p>What barriers might prevent the widespread adoption of SAE For All, and how might we, as a profession, convene to reimagine its purpose and relevance for today’s students and programs? <i>(Examining social dynamics in human and life sciences)</i></p> <p>In light of rapid cultural shifts, such as advances in AI, evolving political landscapes, and changing societal values, how can we convene as a profession to critically examine and shape the future of School-Based Agricultural Education (SBAE)? <i>(Increasing prosperity through innovation in AFNR systems)</i></p> <p>In what ways do systems conveners foster shared meaning and coordinated action across diverse knowledge systems to address biocomplexity in AFNR contexts? <i>(Enhancing environmental health)</i></p>

Note. AAAE Values that correspond to research and practice questions are captured in parentheses following their respective question.

### Leaning into AAAE Values through a Systems-Oriented Paradigm

Our AAAE Values of enhancing environmental health, increasing prosperity, creating spaces for belonging, and nurturing positive youth development, among others, are ambitious and complex (AAAE, 2023). As we lean into these values, we must resist the urge to break down problems into finite components and attempt to solve them in isolation from their broader contexts. Rather, we must embrace complexity

and strive for cross-disciplinary, multidisciplinary, and interdisciplinary efforts in hopes of creating sustainable change. Systems-oriented paradigms can aid us in this endeavor.

Throughout this paper, we presented three theoretical approaches to applying systems-oriented paradigms to our scholarship in AAAE. Each lens offers scholars and practitioners an entry point into new ways of thinking about and interacting with complexity. Consider how these lenses might advance your work. Do you see theoretical constructs in SER, HSD, or LoP as helpful as you answer research questions, develop programs, or address challenges in your academic department? In what ways might you operationalize them? What alignment do you see between these lenses and the AAAE Values? Wrestling with these questions is a meaningful step toward embracing complexity.

To operationalize these reflections, we must turn to the foundational assumptions of a systems-oriented paradigm in AFNR. First, AFNR exists within complex, interdependent systems. Each framework we introduced emphasizes that people operate within and are shaped by complex social systems. Second, all three frameworks emphasize the need for boundary-spanning collaboration and convening to achieve systemic change, accounting for diverse communities, various levels of the system, and shifting containers and exchanges. In AFNR, this calls for a reimagining of how we engage with one another and discuss challenges. Third, interactive sense-making, adaptive action, and learning are core mechanisms of systems transformation.

While these assumptions provide a robust framework for understanding complexity, they also highlight the inherent challenges of implementing such a paradigm within the constraints of AFNR. Working with communities (e.g., SBAE, higher education, etc.) demands resilience, and stakeholders expect actionable solutions, regardless of whether we embrace systems-oriented paradigms. This creates tension between systemic ideals and practical demands, where even in this manuscript, you may have grappled with the contrast between idealistic thinking and the immediate realities of the systems in which we work. One of the most significant challenges with research lies in its fleeting relevance. Solutions are often outdated the moment they confront the problem. This often brings new challenges, each with its own complexities. Bridging the urgent demand for solutions with the delayed response and sustained engagement required by systems-oriented paradigms calls for a shift in perspective. This tension stems from the dominance of linear perspectives and historical ways of operating, which struggle to align with the nonlinear, dynamic nature of complex systems. We argue that systems are how the world works, and progress demands creating adaptive spaces prioritizing learning, iteration, and resilience—what Carse (2011) calls playing the infinite game.

A systems-oriented approach offers opportunities to envision and enact meaningful, long-term change. Embracing complexity requires more than adopting new frameworks, it calls for reorienting how we approach our work and navigate competing commitments. We must continue publishing, teaching, growing programs, responding to stakeholder needs, adapting to university policies, and meeting personal obligations. Yet, as Meadows (n.d.) reminds us, we must also “stop being blinded by the illusion of control...there is plenty to do, of a different sort of ‘doing.’ The future can’t be predicted, but it can be envisioned and brought lovingly into being.” Even in articulating our concluding thoughts, we belie a common problem in approaching problems with systems-oriented paradigms: we cannot simply take systems-oriented paradigms and put them over our former ways of exploring the world and solving problems. Consider some of the research areas outlined in AAAE’s Values document: “investigating biocomplexity in AFNR systems,” “examining barriers, including structural and policy barriers to inclusivity,” and “developing human capital across cultural and geographic boundaries.” Addressing these areas from a systems-oriented paradigm requires us to do more than situate our research topic in a value area. This work is too complex to merely situate. This work may require setting aside topics entirely to embrace complexity in the various areas of our personal and professional lives, including all the partners, organizations, and processes that come with it.

## Conclusion

Throughout this exploration, we reflected on how our thinking aligns with a systems-oriented paradigm. Our breakthroughs—ah-has, lightbulb moments, untangling webs, and discovering new vocabulary—have shaped how we view the phenomena we study while grappling with our own lived experiences. By drawing back the curtain, we aim to spark curiosity and encourage others to embrace complexity, even when it becomes messy. In closing, we acknowledge the tension inherent in this work, the line between self-doubt and unrealistic idealism. Some in AAAE have already adopted these ideas (Marzolino & McKim, 2024a; Marzolino & McKim, 2024b; Marzolino, et al., 2024; McKim et al., 2025), while others may find themselves ready to adopt them, and still others may have already set them aside. Regardless, we offer this work as an invitation to engage, reflect, and grow in an *infinite* game (Carse, 2011). As Meadows (n.d.) so eloquently reminds us:

Systems can't be controlled... We can listen to what the system tells us and discover how its properties and our values can work together to bring forth something much better than could ever be produced by our will alone. We can't control systems or figure them out. But we can dance with them! (para. 6).

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