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Towards a Framework for Building Community-University Resilience Research Agendas

Leah Levac [1,*], Kate Parizeau [2] , Jeji Varghese [3], Mavis Morton [3], Elizabeth Jackson [4] and Linda Hawkins [4]

[1] Department of Political Science, University of Guelph, Guelph, ON N1G 2W1, Canada
[2] Department of Geography, Environment & Geomatics, University of Guelph, Guelph, ON N1G 2W1, Canada; kparizea@uoguelph.ca
[3] Department of Sociology & Anthropology, University of Guelph, Guelph, ON N1G 2W1, Canada; varghese@uoguelph.ca (J.V.); mavis.morton@uoguelph.ca (M.M.)
[4] Community Engaged Scholarship Institute, University of Guelph, Guelph, ON N1G 2W1, Canada; e.jackson@uoguelph.ca (E.J.); lhawkins@uoguelph.ca (L.H.)
[*] Correspondence: llevac@uoguelph.ca; Tel.: +1-519-824-4120

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Abstract: In this paper, we ask: "How can we scope multiyear, multiscalar community–university collaborations that draw on the university's diverse resources and contribute to community resilience"? We approach this question by presenting the development and application of the Advancing Collaborative Transdisciplinary Scholarship Framework (the "ACTS Framework") which we argue has been successful at helping us better understand, foster, and work towards communities' resilience. The ACTS Framework, informed by our collective expertise in critical community-engaged scholarship (CES) and community resilience, contributes to knowledge and practice in critical CES, in particular by providing guidance for scoping and sustaining complex community–university collaborations. The structured yet iterative process involved in the framework development and application affirms and extends the work of other scholars interested in the links between CES and community resilience. Our contributions offer two other important practices—centring community concerns and facilitating cross-project collaboration—to critical CES knowledge and practice and highlight two promising practices of linking structures that facilitate community–university collaborations—specifically, a well-organized institutional memory and holding and bridging relationships.

Keywords: critical community-engaged scholarship; community–university collaborations; community resilience

1. Introduction

This paper is about how a community-engaged scholarship (CES) framework, and its supporting institutional structure at a mid-sized comprehensive Canadian University, can help us better understand, learn from, and foster community resilience. Attention to CES—which traces its historical roots back many decades—has been increasing since Boyer's call in the 1990s to advance engaged scholarship because of its potential benefit for the wider community, students, and higher education institutions (Boyer 1990, 1996; Olberding and Hacker 2016; Bruning et al. 2006; Gelmon et al. 2013). CES responds to urgent calls for addressing pressing ecological, socioeconomic, social and political challenges of our times. This includes enhancing community members' well-being (Levine et al. 2011), and informing local policy conversations (Gonzalez et al. 2011). It also provides an opportunity for institutions of higher education to unite and integrate their three core missions of research, teaching, and service (Stanton 2008). The Community Engaged Scholarship Institute (CESI) at the University of

Guelph implements and supports initiatives that advance rigorous, evidence-informed, and principled critical community-engaged scholarship (CES) in and beyond Guelph. Housed in, and supported by, the University's College of Social and Applied Human Sciences,[1] CESI maintains a suite of programs that work to carry forward this mandate within and beyond its local communities of Guelph and Wellington County. It also supports global community engagement initiatives that align with the principles of critical CES (Da Cruz 2018). CESI works through a range of programs that broker and support local and global community–university research collaborations, community-engaged teaching and learning, and knowledge mobilization planning; CESI also supports community-driven research via paid Research Shop positions for graduate students. In the following pages, we describe a process we—a group of transdisciplinary community-engaged scholars affiliated with CESI[2]—developed to address a common challenge for community-engaged scholars: How can we scope multiyear, multiscalar community–university collaborations that draw on the university's diverse resources and contribute to community resilience?

Authors of a recent review of community-engaged scholarship (CES) argue that identifying promising practices at the institutional and individual levels is necessary to " . . . actually achieve the ultimate objective, which is to influence and contribute to the well-being of our societies" (Beaulieu et al. 2018). Levkoe and Stack-Cutler (2018) reviewed the diversity of brokering initiatives and structures currently in place that act as coordinating mechanisms for developing collaborative and sustainable partnerships that provide mutual benefit. They found that what is lacking is an understanding of how these individual and institutional brokering structures and initiatives meet partners' needs, and what the opportunities and limitations are for community campus engagement brokers when developing collaborations.

Based on long-standing partnerships with the City of Guelph, a midsized Canadian municipality, and eMERGE, an environmental nonprofit organization, we co-developed a framework to prioritize and plan for community–university collaborations pertaining to local community resilience goals. In this paper, we provide a discussion of the strengths and limitations of community–academic partnerships, an overview of the concept of resilience, and a discussion of the contributions that critical CES can make to community resilience knowledge and practices. We then describe the development and application of the Advancing Collaborative Transdisciplinary Scholarship Framework (the "ACTS Framework"), and finish the paper with a discussion of how this framework contributes to successful, ethical, and sustainable critical community-engaged research (CCEnR) practices and community resilience goals.

2. Literature Review

2.1. Strengths and Limitations of Community–University Collaborations

There is a robust body of literature across multiple disciplines (health, education, social sciences, etc.) that has identified common principles and practices associated with community-engaged scholarship. Recent academic literature and scoping reviews (Beaulieu et al. 2018; Da Cruz 2018; Gaurav et al. 2018) identify reciprocity, community-identified needs, and high-quality scholarly investigation of real-life social problems as the most common and important principles for effective community–academic research partnerships. An abundance of literature has identified mainly benefits and positive impacts resulting from CES from the perspective of faculty and academic institutions (Jacquez 2014; Levkoe et al. 2014; Kane 2016; Levkoe 2017). Research from the perspective of students (Kane 2012; Warren et al. 2016; Stack-Cutler and Dorow 2012) and community partners (Schwartz 2010;

Korzun et al. 2014; Sandy and Holland 2006; Cronley et al. 2015) also reports benefits, as does related service learning literature (see Taylor et al. (2015) for a review). Further, there exists great potential for engaging in critical CES[3] as a way to produce and mobilize knowledge that more effectively addresses issues of justice—which are invariably imbedded in community resilience efforts—particularly for more marginalized communities (Da Cruz 2018).

However, studies of community–university partnerships have also identified negative results. For example, Curnow (2017) writes about community research projects that have been experienced by peer researchers as disempowering and alienating. Levkoe (2017) highlights research that speaks to an array of barriers and consequences community partners can face within community campus engagements. Some examples include the need for addressing knowledge hierarchies (Anderson and McLachlan 2016), and reconciling the tensions between knowledge production and action-oriented social change (Warren et al. 2018; Curnow 2017; Stoecker and Tryon 2009), including responding to the pull between developing accessible resources valued by community partners and the production of publications for academic audiences (Watson-Thompson 2015). Failure to address these challenges can prevent an overt focus on justice[4] in practice (Da Cruz 2018), which can in turn re-inscribe the power discrepancies that community-engaged scholars often intend to disrupt and change.

Yet, while limited, there is some literature that examines potential models, structures, and strategies for coordinating community–university partnerships (Watson-Thompson 2015; Mehta et al. 2015; Barkin et al. 2013; Andersen 2017). For example, Anderson and McLachlan (2016) discuss a knowledge mobilization framework for community–university partnerships that they claim is high in impact and relevant for working toward a more just and resilient society. Levkoe (2017) identifies a diversity of brokering initiatives that have emerged as coordinating mechanisms, yet points out that there is very little research documenting and evaluating these initiatives. He suggests that such attempts and experiences be shared. Hall et al. (2009) propose a four-part typology of community–university research partnerships, consisting of: (I) individual faculty–partner relationships; (II) disciplinary, sectoral, or single centre-based arrangements; (III) all-university structures; and (IV) multi-university structures. Furco (2010), using examples from the UK, also proposes a framework highlighting overlaps between the teaching, research, and service activities of "the engaged campus." Also, Janzen et al. (2017) use a program theory of change model to identify the activities, outcomes, and indicators that can be used to plan, carry out, and evaluate community-based research projects. These typologies provide insight into the diversity of CES activities, and the arrangements through which CES can be facilitated. They also highlight the need for an overarching framework to match a university's capacity and resources with community-identified needs, prioritize the use of available resources, and coordinate disparate CES activities occurring across campus.

Unfortunately, as noted by Levkoe (2017), their most promising practices are not fully described. Not only are there benefits of coordination efforts, but also there are risks associated with failing to coordinate related CES activities with an explicit commitment to justice. For example, Wiebe (2015), in her work with Indigenous communities to co-create knowledge and advance environmental justice, reminds us that decolonizing engagement and working toward social change in the context of ongoing colonization is no simple feat. Another risk is that community partners can easily become overburdened by multiple engagement efforts, which can entail substantial time in meetings and training with students and faculty members (Brown-Luthango 2013). Another is that disparate, faculty-driven research agendas can easily come to drive the focus of community–university research

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[3] Critical CES engages mutually beneficial, authentic, reciprocal partnerships between universities and communities with the aim of collaboratively developing and applying critically conscious knowledge to consequential public issues to make society more racially and socially just (Da Cruz 2018, p. 379).

[4] Justice refers to the societal conditions in which all social groups flourish, people value their lives, and individuals, in particular those from marginalized backgrounds, can influence political decisions that impact their lives and support the flourishing of others (Da Cruz 2018, p. 380).

in multiple directions, rather than in a complementary fashion that recognizes the expertise and multidimensional and transdisciplinary research needs of the community partner(s) (Bortolin 2011; Gupton et al. 2014). Moreover, while community–university partnerships can be vehicles for driving meaningful social change, they can also be usurped by, or designed to serve, institutional interests as a way of softening the impact of the neoliberal economic model being imposed on academic activities (Warren et al. 2018; Kliewer 2013; Anderson and McLachlan 2016).

Despite these challenges, when our efforts are coordinated and prioritized, we can do better scholarship. Implying the need for directing a university's diverse and deep capacities and resources towards complex community resilience challenges, "Schwartz et al. (2016, p. 178) explain that community–campus partnerships can provide 'an avenue to address challenges that face society in new and innovative ways by bringing together knowledge, tools, and skills not previously combined'" (in Levkoe and Stack-Cutler 2018, p. 19). In sum, despite cautions put forward about the risks associated with community–university partnerships, the importance of both pursuing and facilitating the coordination of CES efforts that advance justice is clear. Not only because of pressing and imminent challenges facing communities, but also because of the noted strengths of researchers and community partners in our region, community resilience research is a valuable field of focus for attempting to refine a framework that facilitates successful, ethical, sustainable, and interconnected critical community-engaged research (CCEnR) practices.

2.2. Toward Community Resilience

Resilience is a concept that describes an adaptive capacity to address change and shocks on a systemic level (e.g., Cote and Nightingale 2012; Magis 2010). Socioecological resilience references the entwined social and ecological impacts of large-scale environmental damage (such as climate change, deforestation, or resource extraction), and the need for systems-level adaptation to prevent and mediate these impacts. Mainstream socioecological resilience scholarship has been criticized for problematically interpreting societal dynamics through the lens of ecological thinking (Cote and Nightingale 2012), thereby limiting its appeal to social science researchers (Olsson et al. 2015). In particular, socioecological resilience research has been limited in its ability to address cultural dynamics, power, agency, and inequality in social systems; it has also become a framework used to justify neoliberal projects that download state responsibilities through the promotion of self-reliance as an adaptive capacity (Cretney 2014). Others have observed that certain undesirable social phenomena (such as poverty and racism) have proven resilient, and so the persistence of a given social structure does not mean that it is inherently worth protecting (Berkes and Ross 2013; Atallah et al. 2018; Mochizuki et al. 2018). The uncritical uptake of the concept of resilience has led critics to ask, "resilience of what and for whom?" (Cote and Nightingale 2012, p. 475).

Despite its drawbacks, socioecological resilience framings have been taken up by community groups and activists (Cretney 2014). Community resilience has been proposed as a re-centring of the socioecological resilience literature on the social strengths and place-based connections inherent in (some) communities (Berkes and Ross 2013). Magis (2010) defines the concept as follows: "Community resilience . . . is the existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise" (p. 401). The concept of community resilience understood in this way provides an enhanced understanding of the agency of local actors. This concept also resonates with how one of our research partners and other local community organizations frame resilience. For example, "eMERGE leads the way in co-creating resilient, flourishing communities. We do this by connecting citizens and organizations to innovative solutions to maximize resource efficiency and community well-being" (eMERGE 2018). Another local organization states its purpose as "[a] celebration of community resiliency in Guelph. What does it mean to be resilient? When talking about resilience in terms of a community, we believe it means that we are well connected, able to get our needs met locally, and can learn to connect with the

people around us. Resiliency means that we, as a community, are strong, reliable, and self-sufficient" (Transition Guelph 2017).

There are critiques of community resilience that mirror the issues raised with socioecological resilience. For example, Bulley (2013) argues that the UK government's Community Resilience Programme represents the downloading of responsibility for disaster management to local communities, and is in effect an attempt to more intensely govern these communities, rather than empower them. The addition of the word "community" therefore does not negate the discursive limitations of resilience as a concept, although the more meaningful enfranchisement of community members in such initiatives may do so.

As described above, the practice of critical CES has the explicit intent of working reciprocally with communities throughout the research process. CES has contributed to community resilience in a number of ways. For example, Prentice and Signal (2015) demonstrate how CES contributes to community resilience by informing research on the effectiveness of policy, practice, and service delivery. Madsen et al. (2015a) argue that CES can build community capacity, a facilitating factor in ensuring community resilience. CES related to evaluation can also contribute to community resilience, such as by building communities of practice, sharing resources, and building capacity through an arts-based disaster recovery intervention (Madsen et al. 2015b). Based on a series of workshops, Madsen and Chesham (2015, Figure 1.1, p. 8) suggest that "[w]e can use engaged research to build community resilience by focusing on:

- Collective problem solving
- Action
- Learning and capacity building through participation and reflection
- Sharing resources in and of community.

While there is both promise and evidence that critical CES can serve as an important theoretical and methodological orientation in community resilience research, there remains a lack of CES mechanisms for facilitating such collaboratives consistently, and in ways that allow for the development of multiyear, multiscalar collaborations that optimize the application of the university's diverse resources. In the following sections, we describe the process of developing the ACTS Framework, and then return to the four focus areas by Madsen and Chesham (2015) noted above to assess the process that we followed and the outcomes it has generated.

3. Results: Building the ACTS Framework

In response to calls by Levkoe (2017) and others (Nichols et al. 2013; Wright et al. 2011) regarding the need to identify explicit practices associated with institutions that foster collaborative research efforts, and to demonstrate the use of critical CES to foster community resilience, this section details our process of developing a framework for scoping a multiscalar, multidimensional research agenda for advancing community resilience.

3.1. Stage 1. Creating the Framework

The development of the ACTS Framework included three distinguishable but overlapping steps: collaborative problem definition; a one-day transdisciplinary workshop; and creating a draft of the ACTS Framework.

Collaborative and reflective problem definition. The first and most amorphous step in the process evolved over several years of CES work in and around Guelph, facilitated by CESI.[5] At the core of this part of the process were deep commitments to self-reflexive practice (Tobias et al. 2013) and

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[5] This work involved not only the authors of this manuscript, but also others who have played a variety of roles in the development of community-engaged scholarship practice at and through the University of Guelph over the past 15 years. We are particularly grateful to Lindsey Thomson for her work in *Stage 1* of this process, including by helping to develop and support the one-day transdisciplinary workshop described herein. We describe this step as being indiscrete in the sense that it both preceded and underpinned the other steps in this stage.

reciprocal learning and benefit (Beaulieu et al. 2018; Da Cruz 2018; Janzen et al. 2017). In other words, we continuously tried to understand the ways in which our past partnerships had or had not achieved their desired outcomes, and the reasons for these shortcomings or successes. This involved a commitment to understanding the institutional and practical barriers navigated by both community and university partners. Our efforts played out through dozens of iterative formal and informal conversations where we asked ourselves and each other questions such as, "what is stopping us from building the most effective research partnerships possible?", "why are we struggling to make headway on this issue?", and "what would make our collective work more impactful?". Through this step, we came to understand two particular problems to which the framework responds.

The first problem relates to the persistent limits of our ability to sustain collective problem-solving efforts, a requirement for using engaged research to enable community resilience (Madsen and Chesham 2015). Particularly, through our examination of our own past practices, it became clear that we were not yet effective at multiscalar collective problem solving. We needed to become better at answering, "how can both community and university partners position themselves as better linking agents between local, regional, national, and international resilience efforts?". The second relates to institutional teaching and learning and funding structures that privilege university-based and project-based approaches to research over broader interconnected research agendas. Funding cycles and application requirements, rigid course schedules, accounting practices, and other institutional dictates undermine efforts to more equitably distribute power in collaborations, and to draw broad connections between related research and initiatives. A corollary to this problem is the challenge of trying to ensure that each component of a larger research effort learns from the other pieces. For example, we needed to become better at answering, "how do the results of research focused on better understanding community resilience values get taken up in subsequent research?". Defining these problems, albeit somewhat loosely, led us to be able to frame the second step in this stage of the process.

One-day transdisciplinary workshop on sustainability and resilience. The second important step in the creation of the ACTS Framework was a one-day workshop attended by: approximately 25 community partners both involved with, and external to, the ensuing resilience and sustainability research agenda; approximately eight faculty members from several social science disciplines and with diverse research agendas; and approximately five staff members whose work priorities include knowledge mobilization, community-engaged learning, and facilitating community–university research collaborations. This workshop included a visioning session where participants were asked to reflect on the following questions, keeping in mind the overarching goal of advancing sustainability and resilience: "(1) How do you do research? and (2) What do you want to know? What are you missing? If you had a research staff of nine people, what would they be doing?" (workshop summary notes from 2015). The results of these discussions were coded to identify categories of research questions, and then analyzed by author J. Varghese and faculty colleague C. Johnson. Their intention was to communicate the results of the workshop in a form that could serve as a foundation to our thinking about how to come to a multiscalar, multidimensional research agenda. Their analysis revealed that the workshop had generated two important sets of ideas. First, participants' responses during the visioning session revealed both applied and theoretical questions that community organizations and university-based researchers grapple with in their work related to sustainability and resilience. Many of the applied questions raised pointed to challenges in promoting behavioural change (e.g., "How can we increase the number of people commuting by bike and public transit?"), whereas theoretical questions focused more on broad conceptual interconnections (e.g., "In which ways is sustainability connected to broader ideas of social justice and inequality?"). This distinction, though not entirely discrete, provided a helpful starting point for trying to understand the scope and priorities of regional sustainability and broader resilience research agendas.

Creating a draft of the ACTS Framework. Building on the analyzed results of the one-day transdisciplinary workshop, author L. Levac initiated a first draft of the framework, imagined as a "matrix . . . [where] a number of thematic research areas are affected by a number of cross-cutting issues" (framework draft notes from 2015). The preliminary version (a precursor to the images pictured in Figures 1 and 2) posited

that a number of broad cross-cutting issues (e.g., values and assumptions; engagement, inclusion and relationships) had implications for, and could be informed by, a host of thematic areas (e.g., food, waste, water, technology, strategic planning, and change) where local community organizations held substantial experience and expertise. Additionally, in the original design, we imagined that the thematic areas and the cross-cutting issues would intersect to create a series of research questions, and that we would subsequently be able to identify interconnected research programs, effectively at the intersection of each row and column.

Several other ideas emerged through the development of the first draft of the framework. First, L. Levac's reflections during the development of the draft noted that the "cross-cutting issues were especially important as sites of knowledge mobilization (KMb) within the overarching research agenda; that is, as our understanding of each cross-cutting issue evolved, new knowledge [could be] applied across [and within] each thematic research area" (framework draft notes from 2015). Second, in line with the important analytical ideas that emerged from the one-day workshop, it became clear that some temporal and sequential considerations of the execution of the research agenda would be necessary. In other words, it would be desirable to begin with questions from each of the thematic research areas that were most likely to contribute to the group's knowledge about, and understanding of, shared cross-cutting issues. Third, it was important to think about the broad research agenda as constituting a double-loop process. The implication of this idea was that there should be intentional points along the path of the unfolding research agenda where the group asked itself: "Are we sufficiently incorporating what we're learning into the next stages of our work?" And, "Have we learned anything that should cause us to shift/change our thematic research areas and/or our cross-cutting issues substantively?". We also determined that the process we were aiming to facilitate through the ACTS Framework insisted on adopting a commitment to praxis. The definition of praxis has evolved in different theoretical traditions, including feminist and Marxist scholarships, but the term is broadly understood as a liberatory process (Freire 1970), and an inextricable tenet of action research whereby "knowledge, primarily conceived as purely an intellectual pursuit, was freed in order to become intertwined with action" (Cunningham 2017, p. 295). Our commitment to praxis involves understanding our sometimes simultaneous involvement in both careful empirical research and strategic community engagement in related initiatives. This is also in keeping with our underlying commitment to critical CES.

3.2. Stage 2. Developing the Agenda

Two of this article's authors (K. Parizeau and J. Varghese) who have experience in sustainability and resilience research subsequently worked to tailor the draft framework to the local priorities and strengths identified in the community–university workshop described above. We initially imagined that we would suggest specific research projects to the community partners based on the framework, including proposed research questions and study design guidelines. We quickly realized that while we agreed with the ideas established in the creation of the draft framework (e.g., intersections of cross-cutting issues and thematic areas, commitment to a double-loop process and praxis), we preferred to proceed by identifying themes and trends from the workshop outcomes that would allow us to suggest a process for collaboratively designing a diversity of research projects that not only aligned with community capacities and priorities, but that also addressed clear research questions with sound methods. The four themes that we identified were as follows:

(a) Environmental service provision models and technological change (e.g., comparing different public/private service models for transit, waste management, or energy provision systems; evaluating models for food distribution and nutrient cycling);

(b) Environmental system visioning, policy, and planning, including behaviour change and structural or systems change (e.g., identifying leverage points for shifting planning paradigms or enabling regulatory changes; evaluating the impact of interventions with respect to systems change);

(c) Effecting social change for environmental good at the individual or community scale (e.g., identifying place-based social levers for environmental change, identifying the appropriate scale of intervention for environmental advocacy and social change); and

(d)　Environmental leadership (e.g., capacity building for environmental leadership; creating and assessing new models of environmental advocacy).

J. Varghese and K. Parizeau then created a separate table for each theme area, with consistent row and column content across all four of the tables. In each table, the rows represent content areas of expertise within the community (e.g., transportation, food, energy, waste, water, and strategic planning, innovation, and change), and the columns represent thematic research issues cutting across the content areas that need to be thought through when developing research questions (e.g., whether the unit of analysis or the sociopolitical context of the issue constitutes a key variable of analysis; whether the research project will allow for a meta-analysis of the role of CES in knowledge production). In this instance, the identified research issues pertain to social science paradigms of inquiry, but are inherently interdisciplinary in the sense that they meet at the intersections of social science disciplines, and could easily take up thematic issues that intersect with science, technology, engineering, arts, and math (STEAM) as well.

We then shaded areas within each thematic table (see Figures 1 and 2 for two examples) to indicate which intersections of content and research issues were most likely to provide fruitful and operative research questions, and to inform subsequent research questions. Those intersections with the most promise are shaded the darkest, indicating that these are the intersections for each respective theme where the community–university actors are best equipped to focus their attention on collaboratively designing research projects. To a large extent, these promising intersections were so-identified based on our extensive collective experience in designing research, combined with our knowledge of the respective fields. For example, Figure 1 highlights our assessment that within the theme of environmental systems visioning, policy, and planning, a focus on strategic planning, innovation, and change (bottom row) offered high potential for informing research questions about balancing conceptual and applied questions, enhancing our understanding of single- and double-loop research goals, etc. (columns 1–7), but limited potential for helping to advance community-engaged scholarship.

The framework is designed to be flexible and to be used iteratively, allowing community–university partnerships to adapt the content and research issues to their particular topics of inquiry, as well as to changes in expertise that arise as participants enter and exit the project. The table-based design also allows us to track the research projects that emerge within each theme, visualizing which areas of inquiry are most heavily covered, and which could benefit from future research.

Figure 1. Framework tool for theme (b) Environmental systems visioning, policy, and planning. Darkest cells represent intersecting research foci with most potential (see text above for further explanation).

c) Effecting social change for environmental good
- E.g., identifying the social levers for environmental change, considering the appropriate scale of intervention for environmental advocacy and social change, etc.

	Balance between conceptual and applied	Is the goal to enhance current practices (single loop), or is the goal to research a completely new/different approach (double loop)?	Unit and level of analysis (space, place, and scale)	Sociopolitical Context	Values & grounding assumptions (What is the ideal future state? By whom should/will they be born?)	Engagement/ inclusion/partici pation (How do we best include whom? Who's in and who's out? What prevents/enabl es engagement?)	Leadership & management (What models of leadership, collaboration, and action will get us there?)	Advances in collaborative/ community-engaged scholarship (How do we produce engaged knowledge? What are praxis exemplars?)
Transportation								
Food								
Energy								
Waste								
Water								
Strategic Planning, Innovation, and Change								

Figure 2. Framework tool for theme (c) Effecting social change for environmental good. Darkest cells represent intersecting research foci with most potential (see text above for further explanation).

Enacting the framework to design research projects requires the involvement of content experts (likely community members who are working in the relevant fields, and possibly academic researchers in those fields), as well as community-engaged scholars who: understand the vision of the project; are able to help link the projects within the university; and can help to scope the timeline and resource needs for different types of research projects. In our case, we convened J. Varghese and K. Parizeau, who are academics working on environmental issues and who use community-engaged approaches in their research; L. Hawkins, K. Schnarr, and L. Thomson, CESI staff members whose expertise lie in the development and implementation of community–university partnerships, the executive director of a local eNGO (eMERGE), and two City of Guelph municipal staff working on environmentally-related files.

We began the meeting by presenting the framework, and then asked attendees to identify their priority areas of inquiry that they believed could benefit from research interventions. Based on the expertise in the room, we decided that the topic that was of widest interest, and that could most benefit from existing institutional capacity, was focused on the introduction of sociotechnical transitions to cleaner energy (hereafter referred to as local energy–economy system transitioning). Because this was the inaugural use of the ACTS Framework, we collectively decided to focus on this one content area.[6] The community members then elaborated on the topics they wanted to learn more about within the content area of local energy–economy system transitioning. We collaboratively sorted these prospective areas of inquiry into one of four tables, based on their thematic orientations (i.e., according to research themes (a) to (d) noted above).

No research questions arose within the first theme of (a) Environmental service provision models and technological change. This is likely because the municipality already had an extensive and well-resourced energy planning division, and so had already investigated many aspects of energy provisions systems prior to this project. Under the theme of (b) Environmental system visioning, policy, and planning, the group used the framework to refine the following two research questions:

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[6] In future applications of the ACTS Framework, we anticipate being better positioned to operationalize more than one content area at a time.

- What are best practices of systemic interventions to impact energy generation, delivery, and use?; and
- What are the thematic similarities between the interventions identified above?

On the theme of (c) Effecting social change for environmental good at the individual or community scale, the following research questions arose:

- How do stakeholders talk about energy and economy?; and
- What are potential discursive entry points for building a collaborative conversation around the energy/economy nexus?

Finally, on the theme of (d) Environmental leadership, the two research questions that emerged were:

- What are best practices for the governance of energy efficiency, conservation, and renewables?; and
- What are the thematic similarities between the effective leadership and management strategies identified above?

During the meeting, we brainstormed and recorded lists of potential research methods to address each research question. We also discussed relevant potential resources (including people [e.g., the names of relevant faculty, staff, and graduate students] and program structures [e.g., discipline-based courses, thesis options, and independent study opportunities]) on campus that might provide curricular homes for some of the research projects. Subsequently, we sent messages to an extensive list of prospective researchers and instructors to assess their interest in contributing to this initiative.

CESI then initiated a series of four group meetings between interested university and community members. As individual projects developed, university and community partners self-organized their ongoing communications. Following is a partial list of the research projects that arose through this process. These examples are chosen to reflect the diversity of the community–university collaborations that arose, and thus that are possible. The majority of these projects were led by K. Calvert, who is one of our faculty colleagues at the University of Guelph, and whose research program centres on community energy:

(b)   Environmental system visioning, policy, and planning

- Successful application for a nationally-funded research grant to investigate the planning, implementation, and governance of community energy projects in Canada (K. Calvert)
- Completion of third-year class assignments to conduct literature reviews and make presentations assessing factors that shape renewable energy development (K. Calvert)
- Completion of fourth-year projects in applied geomatics to assess the potential for different energy system alternatives in Guelph and the Province of Ontario (K. Calvert and Adam Bonnycastle)
- Ongoing deep household energy retrofit study (MA student T. Einman, supervised by J. Varghese)

(c)   Effecting social change for environmental good at the individual or community scale

- Completion of a third-year Independent Study on media framings of Guelph's Community Energy Initiative (supervised by K. Parizeau)
- Completion of an undergraduate honours thesis on socioecological impacts of renewable energy (M. Shakespear, supervised by J. Varghese)
- Ongoing analysis of a multiyear community-based research project focusing on household sustainability practices (Undergraduate Research Assistant M. Shakespear, supervised by J. Varghese)
- Ongoing Ph.D. thesis investigating the sociotechnical contexts within which building energy management and community energy planning occur (Ph.D. student A. Kantamneni and supervisor K. Calvert)

(d)   Environmental leadership

- Completion of an MA thesis assessing the governance and leadership factors influencing the development of community energy in Guelph (MA student M. Johnson Steeves Wilson, supervised by J. Varghese)
- Deputations made by two faculty members to the City Council of Guelph about the academic potential to study the Energy Efficiency Retrofit Strategy of the municipality (K. Calvert and K. Parzieau)
- Appointment of K. Calvert as Co-Chair of the City of Guelph's Energy taskforce established by the City Council to update and assess the City's Community Energy Initiative

Subsequent implementation steps included a host of meetings where university staff and faculty discussed not only strategies for maintaining reciprocal collaborations with community partners, but also ways to ensure that the communities' priorities would remain centred in the process, rather than being pulled towards university research priorities. We identified a small group of community and university champions who accepted the premise of community-driven questions, and could support the framing of projects as they evolved (framework planning meeting notes from 2015). As the above-noted projects proceed and conclude, opportunities for the next phase of projects will emerge. Because of the "double loop" nature of the ACTS Framework, which reflects the incorporation of important CES commitments such as reciprocity (Dostilio et al. 2012; Beaulieu et al. 2018; Da Cruz 2018; Gaurav et al. 2018), subsequent projects will benefit from the findings of those initiatives noted above.

4. Discussion

4.1. Community-Engaged Scholarship for Community Resilience

Through its development and application, we learned that several features of the ACTS Framework are important for, though not exclusive to, developing community resilience research agendas. The ACTS Framework recognizes community resilience and other complex socioeconomic and ecological challenges as multiscalar and systemic issues. It does this by considering thematic research issues (e.g., leadership) that cut across important content areas (e.g., water, food, energy). The content areas have local, regional, national, and international dimensions, which can be examined both discretely and in association with each other. Returning to Madsen and Chesham (2015) summary of the key contributions that engaged research can make to community resilience, our experience in applying the ACTS Framework both confirms and expands on the four foci identified by these authors: collective problem solving, action, learning and capacity building through participation and reflection, and sharing resources in and of community.

Collective problem solving. Collective problem solving is evidenced by the resulting research agenda, which was only possible because of the expertise of community-based partners. Projects undertaken are not only responsive to community needs, but are also reflective of a more reciprocal understanding of community partners' capacities, an understanding that, importantly, informs students'—and therefore future researchers'—research values, understandings of community partners, and ideas about what genuine reciprocity in CES looks like.

Action. Action is evidenced by the projects that resulted from the application of our framework. The projects identified above highlight a range of ways that a university's resources can be brought to bear on a community's resilience and sustainability agenda. Undergraduate and graduate courses, graduate-level research projects, faculty research programs, and knowledge mobilization and outreach efforts are all contributing in a coordinated way to the interlocking community resilience research agenda that emerged through our application of the ACTS Framework. Conversely, the ACTS Framework helps to reveal a number of pathways through which communities' research needs can be addressed with the support of university resources, while also helping to achieve the university's education function. For example, students have so far been involved in the resulting research agenda in at least three distinct

ways (course-based work, independent undergraduate research, and graduate research). These avenues are now highlighted for local organizations with whom our university is likely to work in the future.

Learning and capacity-building through participation and reflection. Our community partners have informed us that learning and capacity-building occurred through the outcomes of the projects that resulted from the application of the framework. In developing the ACTS Framework which centres community expertise, we as university partners also learned and built our capacity through this exercise. The ACTS Framework also offers the potential for informing more coordinated and targeted community-engaged scholarship training and mentoring opportunities for students, staff, and faculty. The four identified themes can be understood not only as areas demanding research attention, but also as areas that can ground researcher training. They can be used to inform, among other things, methodological training workshops (focused on methods brainstormed during the development of the research agenda), student recruitment efforts, reading groups, and research communities of practice.

Sharing resources in and of community. This practice was integral to the successful completion of the above-listed projects. These have been truly collaborative initiatives that drew on community partners' resources, including their networks, their historical knowledge of the evolution of resilience initiatives in Guelph, and their understanding of important points of intervention in the political process (e.g., through deputations to City Council). Further, the ACTS Framework enables the contribution of community and university actors whose expertise fall near to—but outside of—the study of community resilience. For instance, some of this article's authors are not resilience scholars, but have nevertheless been able to contribute to these initiatives by offering analytical support in the initial framing of the research agenda. While this is an example of recruiting diverse resources to support a community–university collaboration, the engagement of these actors also represents an important element of capacity optimization, whereby scholars whose work may not be community-focused can nevertheless make valuable contributions to the critical work of building community resilience by, for example, contributing "research service" in helping to scope a viable research agenda. The act of scoping a complex, multidimensional community resilience research agenda as we have done through the ACTS Framework also provided the unintended benefit of creating space for faculty members who might be interested in pursuing resilience-related research, but who might find entering such a large and complex field overwhelming. By identifying a number of relatively small projects, faculty members interested in "dipping their toes" into community engaged resilience research can be more easily invited to join the effort.

4.2. Contributions of the ACTS Framework to Critical CES Knowledge and Practice

Beyond affirming the foci identified by Madsen and Chesham (2015), and in addition to supporting our partners' community resilience goals, the development and application of the ACTS Framework makes important contributions to critical CES knowledge and practice. Through developing and applying the framework, we have demonstrated its utility in supporting the creation of multiyear, multiscalar CES agendas, in this case, to advance community resilience. By critically reflecting on and analyzing our work, we are able to highlight how our framework can centre community concerns and facilitate cross-project communication and mutually reinforcing learning. In addition to these two findings, we have identified important practices of linking structures that facilitate community–university partnerships. These three points are elaborated below.

Centring community concerns. At the core of centring community concerns is the need to take seriously persistent challenges with inequitable power distributions between community and university partners (Da Cruz 2018; Davis et al. 2017; Cheney 2008). One notable way that our framework disrupts traditional power relations is by arranging the framework's foundation according to areas of expertise found within the partner organizations, in this case, an eNGO and a mid-sized Canadian municipal government. Positioning partners' expertise as critical to scoping the research agenda is not only practical in that it helps to ensure sufficient capacity for carrying out the work, but also symbolic in that it resists the myth that expertise is mostly held in universities. Having said

that, and as we have noted above, the framework does not dismiss the vast and diverse expertise that does exist within the university. Though we have yet to undertake a formal evaluation of the initiatives listed above, our preliminary observations and experiences suggest that the effect of this centring includes more willingness on the part of both community and university partners to build on each other's ideas, rather than vie for idea supremacy.

Facilitating cross-project communication and learning. Our framework facilitates cross-project communication by recognizing the need for intentional points along the path where disparate project teams, including their community and university partners, come together to revisit the evolution of the research agenda, and particularly the questions emerging. This is essential for ensuring that the findings from one piece of research inform and contribute to framing and implementing other pieces, a commitment to iterative learning and research design that is facilitated not only through intentional cross-project communication, but also through the "double loop" and "praxis" orientations of the framework. This intentionality is also critical for facilitating resource sharing and optimization, which, as noted above, is identified as an important component of building meaningful resilience research agendas (Madsen and Chesham 2015). The ACTS Framework contributes to resource sharing and optimization by serving as a prioritizing and sequencing tool. In other words, its application allows us to determine which research projects should be given priority, not only because of our capacity to address them, but also because their results could contribute to future projects. This recognizes the pressing needs of community partners and practitioners with regards to their community resilience efforts, and contributes to the efficient use of resources by ensuring that prerequisite questions can be answered in a way that serves multiple future research questions. These features are critical given that community resilience research is taking place in a rapidly changing and politically volatile context. In other words, the urgency of learning from each other's efforts is highlighted by considering the pressing need for building resilience and sustainability.

Promising practices of linking structures for facilitating community–university collaborations. As noted above, centring community relationships and shifting power dynamics to pursue critical CES remains a challenge. Also as previously discussed, one promising response to this challenge is through the development of linking structures, whose features and promising practices are understudied (Levkoe 2017). Beyond the above noted results, an important finding from this work is its contribution to understanding promising practices of linking structures in meeting community needs, a noted gap in CES scholarship (Levkoe 2017). The success achieved to date with the application of the ACTS Framework is due in no small part to the contributions of CESI as a linking structure. Two particular practices are evident.

One is the provision of a well-organized institutional memory. As discussed above, the first step in the first stage of creating the ACTS Framework involved countless formal and informal meetings, which laid the foundation for a more formal transdisciplinary workshop to emerge. Given the time pressures that exist for people working both in community organizations and in postsecondary institutions, experiencing extensive redundancy can sour peoples' commitment, and thus their willingness to participate. By creating an effective record of a chaotic and nonlinear process, a linking structure can help to ameliorate this challenge. It can also help to ensure the robustness of multiyear, multiscalar collaborations. An example of such robustness is evidenced through the partnerships' ability to persist despite the departure of a critical municipal government staff partner. Indeed, the strong and organized institutional memory allowed for several projects to continue despite this loss.

A second important practice of linking structures is holding and bridging research relationships. Specifically, the success of our framework to date includes relying on CESI to help find appropriate university-based partners to collaborate on specific initiatives, and to support initiatives once they are established. An example of this is that CESI's community-engaged learning team offers direct support to classes in the social and applied human sciences that include partnered research projects. This support, which can range from scoping projects to meeting with project teams to help them navigate relational challenges, not only provides capacity-building opportunities for everyone involved, but also helps to prevent small challenges from becoming significant issues.

Even with the capacity of the ACTS Framework to centre community concerns and facilitate cross-project communication, these two practices remain a challenge. Complex institutional ethics review processes, research funding rules that privilege researchers based at postsecondary institutions, and disciplinary silos all have the effect, even if unintentional, of complicating our efforts in this regard (Ross et al. 2010; Wallwork 2008; Cheney 2008; Davis et al. 2017). In other words, we anticipate that our continued efforts to operationalize our framework with integrity will face tensions and resistance (Bowers 2017), which we will need to confront. As well, while the specific practices of CESI as a linking structure at the University of Guelph are both notable and critically important, it is nevertheless the case that many of the projects associated with this first application of the ACTS Framework were ultimately championed by a very small group of faculty members, who were admittedly already committed to the broad principles and practices associated with critical CES as discussed in the introduction of this paper. Therefore, in our next effort to use and refine the framework, we will be attentive to the extent to which we are able to enable additional interested faculty members to pursue more community-engaged approaches to scholarship. As mentioned above, we have not yet assessed the impacts of the projects that arose from the application of our framework. While we know that these projects have successfully built connections between community and university partners, we do not know whether the application of the framework has led to a different quality of CES outputs compared to other brokering processes.

5. Conclusions: Beyond Community Resilience

In this paper, we set out to answer the question, "How can we scope multiyear, multiscalar community–university collaborations that draw on the university's diverse resources and contribute to community resilience"? Building on critical CES and community resilience literature, and drawing on our collective expertise in these fields, we present the development and operationalization of the ACTS Framework. The preliminary application of our framework highlights diverse ways in which the university's vast resources can be brought to bear on critical problems undermining community resilience. The stages of the framework's development, and the practices and projects that ensue, highlight the value of this structured yet iterative process, and affirm earlier work by scholars interested in the links between CES and community resilience (Madsen and Chesham 2015). The development and application of the ACTS Framework also underpins two other important practices—centring community concerns and facilitating cross-project collaboration—that we offer as important contributions to critical CES knowledge and practice. Finally, we highlight two promising practices of linking structures that facilitate community–university collaborations, contributing to a noted gap in the field.

Because this paper reports on our first application of the ACTS Framework before the outcomes of emergent initiatives can be felt, it would be premature to definitively claim success. Nevertheless, we note several important findings that clearly contribute to knowledge and practice, not only in understanding and fostering community resilience, but also in the knowledge and practice of critical CES. Our next steps are twofold. First, we intend to revisit the projects that emerged from the application of the ACTS Framework, including those listed above, to evaluate not only their contributions to the City of Guelph's resilience work, but also to participating students' capacity development. Second, we will explore opportunities for applying our framework in other complex areas to refine its use, and to create opportunities for examining differences in the results of its application across fields. Possible areas for expanding the application of the ACTS Framework include community poverty elimination and confronting adverse childhood experiences, which represent other notable areas of community expertise in our city, and at our university. These are challenging times for communities and for universities. Our collective capacity to respond to complex and dynamic socioeconomic, ecological, and political challenges (Ramaley 2014) hinges on our ability to learn from and with one another in reciprocal ways. The ACTS Framework offers a way forward in this challenging space.

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