

PhD Thesis Proposal

EMERGING FROM THE LAND: NARRATIVES OF CHANGE IN
LAND-BASED LIVELIHOODS

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1. Non-Technical Summary (250 Words)

Human activity has increased in the last 200 years, bringing unprecedented success in poverty alleviation, technical innovation, and social complexity. However, it has created a crisis with globally significant impacts on climate, biodiversity, social equity, and justice. In the middle of the 20th Century, recognition of limits to economic growth that fuelled this 'Great Acceleration' led to efforts to pursue sustainable development. While the sustainability agenda, including international climate and biodiversity agreements, has met with some success, progress is slow. There is criticism that sustainability goals will not be met through the continued economic growth and social complexity that underpins the current crises. New approaches shift the search for solutions to the problematic way we perceive the world and act within it, including re-evaluating core values and beliefs contained within the narratives which shape our interactions with the world and each other.

The acquisition and distribution of resources for food, is one of the most significant drivers of patterns of human activity and underpin all the SDGs. Sustainability solutions are frequently divided into opposing narratives of technological innovation versus a return to a rural/pastoral idyll. Through interviews, participatory workshops and novel "mass-sensing" methods, this research will explore the narratives of land-based livelihoods to reveal core values, beliefs and themes that influence current decisions and scenarios of social and ecological change. It will offer (i) an opportunity for sensemaking and action planning for those engaged in land-based livelihoods and (ii) insights for legislation and policymakers seeking to create space for deep social change.

2. Introduction and problem context

Outline the scholarly and practical/social relevance of your project. Explain the core sustainability challenge or problem, and indicate how your work can address this challenge (i.e., the 'so what').

Introduction

The purpose of this thesis is to explore the narratives that locate people in the complex social ecological systems at the heart of modernity, in order to understand how they influence our framing of and progress towards sustainability. Its important for me to begin by situating myself in this complexity as a researcher, a land- worker and as a member of what Fisher called *Homo narrans*- the storytelling human (Fisher, 1985). Crucially, I am not a detached observer but have a stake in the outcomes of systems change. The philosopher Alistair Macintyre wrote "*I can only answer the question 'What am I to do?' if I can answer the prior question 'Of what story or stories do I find myself a part?'"* (Macintyre, 1981, p. 216). Through our experiences we can only ever embrace part of the whole, so this narrative is necessarily a partial one, but through it I hope to underline the importance of narratives for sense-making and action in social-ecological sustainability.

Limits to Growth and Sustainable Development

While the activity of modern humans has remained relatively constant ever since our evolution in Africa c. 200,000 years ago, in the past 200 years, it has undergone a 'Great Acceleration' (Steffen et al., 2015),

causing unprecedented and globally significant anthropogenic impacts on biophysical systems (Crutzen, 2002; Steffen et al., 2007, 2015).

The causes of acceleration are many but centre around fundamental resource-use activities to meet the desires and demands of an increasingly complex society. This has been facilitated by advancements in technology which allowed the harnessing of first steam and then fossil fuel energy with a higher return of investment beyond that of human labour, sparking the industrial revolution (Christian, 2011). Intimately associated with this was the emergence of powerful ideas around the organisation of the economy, e.g. (Marx, 1909; Smith, 1791), which became increasingly reductionist in their approach.

Since the 20th Century, Capitalism has emerged as the most lasting political economy and has brought enormous and unprecedented success in the alleviation of poverty and technical innovation (Harari, 2014; Pinker, 2019). On the other hand, modern alternatives focusing on non-market and centralised planning have mostly failed, with severe ecological and social impacts (Feshbach, 1995; Gray, 2015; Scruton, 2012). Capitalism's central mechanism of growth is sustained in the face of mounting evidence of ecological and social degradation (Crutzen, 2002; H. E. Daly & Farley, 2010). Continuing criticisms of capitalist-based economics have led to a profusion of heterodox economic theories including steady-state economics (H. E. Daly, 1980), environmental economics, feminist economics, degrowth, ecological economics (H. Daly & Farley, 2004), doughnut economics (Raworth, 2018) and complexity economics (Arthur, 2021).

Early and significant acknowledgements that there were limits to the levels of growth that the earth might sustain (Meadows et al., 1972) heralded the beginnings of global attempts to work towards sustainable forms of achieving human wellbeing (Reid et al., 2005; United Nations, 2015; WCED, 1987). This recognition led to calls for "sustainable development" and, subsequently a global process under the umbrella of the UN to manage this new direction within 17 Sustainable Development Goals. More recently international. The growing evidence for the impacts of human activity on the earth has led to further international agreements on Climate (IPCC, 1990) and Biodiversity (IPBES, 2019)

Perception and Problem Framing

While the SDGs mark significant shifts in tackling problems caused by human activity, critics call out their continuing dependence on economic growth and high levels of social complexity to deliver sustainability solutions (Kish & Quilley, 2021a). However it was the discovery and use of fossil fuels with a high energy return on investment which have enabled increased energy flows and a stark increase in social complexity (Christian, 2011; Kish & Quilley, 2021a). Economic models that under-pin ideas of growth are based on simplistic assumptions relating to supply and demand, the role of energy and the rationality of human behaviour (H. E. Daly & Farley, 2010) and are a direct legacy of the Enlightenment search for fundamental rules in the social sciences to match those in the physical sciences. Heterodox approaches to economics reject continuous growth as a mechanism for driving prosperity and accept in principle *social and ecological limits* (Jackson, 2009; Raworth, 2017; Rockstrom, 2009; Victor & Rosenbluth, 2007), but without clear pathways for their implementation.

Solutions to the sustainability crises target reductions in CO2 or increase in habitat restoration projects as accounting problems **without focussing on the systems that created the problems**. The mechanistic and reductionist approaches that underpin modernity may be the most appropriate for revealing the properties of, and working with, problems of non-living materials, but are not a good fit to understand

and work with the complexity of living systems (Berman, 1989; Capra, 1997; Capra & Luisi, 2014; Eisenstein, 2013). This suggests that, as Einstein is thought to have said, current **problems will not be solved by the same mechanism that created them**.

The concept of sustainability is itself mired in problematic framing. Sustainability of what, and for whom? Entrenched perceptions around modernity have led to fundamental barriers to proper understanding and acting in the current 'sustainability' crises

- Solutions for sustainability continue to rely on high-energy complexity.
- Enlightenment framing has led to a narrative of continuous, linear human progress and a quest for innovation, away from low-tech/ manual, low-energy, approaches that humans used to solve problems before modernity.
- Problems are complex and often intractable or "wicked" (Churchman, 1967; Rittel & Webber, 1973).

What has become clear is that there is an urgent need to shifts or transformations to sustainability which will require fundamental systemic shifts in values and beliefs, patterns of behaviour and governance (Westley et al., 2011), but there is **little in the way of evidence** that complex social-ecological systems that characterise human society are open to transformation at necessary and sufficient temporal and spatial scales.

Food and Sustainability

Networks which govern food production and distribution are one of the largest drivers of patterns of human activity, and are effective at demonstrating these failures of perception and problem framing. From hunter-gatherers to modern agriculture, food systems have shaped culture and politics (Graeber & Wengrow, 2021). Agriculture is the primary connection between people and planet. It is the most dominant land-use providing essential services to humanity, but not without costs: taken as a whole, agriculture has a major carbon footprint (IPCC, 2018), contributes to the degradation and loss of habitats and species (IPBES, 2019) and is implicated in a range of social-ecological and social problems (details). Modern agricultural production is well documented as a major contributor to environmental change (Beddington et al., 2012; Foley et al., 2005). Of the nine planetary boundaries (Rockström et al., 2009), agriculture is the major driver for breaches of four (biosphere integrity and biogeochemical flows (known); land-system change and freshwater use (uncertain)), a significant contributor to a fifth (climate change) and a driver of change in those boundaries still in the safe zone (Campbell et al., 2017). Current food systems use about 30 percent of globally available energy, and this energy accounts for about 30 percent of agri-food systems greenhouse gas emissions because modern food systems are heavily dependent on fossil fuels. 70% percent of the energy consumed by agri-food systems occurs after food leaves farms, in transportation, processing, packaging, shipping, storage, marketing, etc. An estimated one-third of the food we produce is lost or wasted, and with it around 38 percent of energy consumed in food systems (FAO & IRENA, 2021).

Agriculture is a focus of global efforts towards Sustainable Development. The delivery of all 17 Sustainable Development Goals requires transformations across agricultural systems (FAO, 2018, 2019). However there is continuing debate over what constitutes 'sustainable agriculture' which is often reduced to competing ends of the 'Techno-economic' vs' agroecological ruralist' axis; in practice however these binary definitions often mask more complex and context-dependent combinations of

goals, strategies and fields of action (Velten et al., 2015). Alternatively, a focus on the scale of action to transform systems yields a shallow-deep axis, from incremental changes such as optimizing agricultural efficiency through technical fixes versus profound changes that require '*deep shifts that challenge established assumptions, beliefs, and values, along with institutional arrangements, development paradigms, and power relations at multiple scales*' (Skrimizea et al., 2020, p. 257). The increasingly technological direction of modern society favours incremental technical fixes towards farm intensification and substitute food, which masks no less a deep shift towards more globalisation, centralisation and urbanisation than does the reclaiming of more rural, local farm networks. As Wendell Berry puts it, "*Epic feats of engineering require only a few brilliant technicians and a lot of money. But feeding a world full of people year to year for a long time requires cultures of husbandry fitted to the nature of millions and millions of unique small places*" (Berry, 2018, p. 333). As has always been the case, questions around sustainable agriculture are not simply about where we get our food, but are tightly bound to the processes, patterns and resilience of social and political institutions. Re-defining agriculture as a social-ecological system encompassing bio geophysical and social interactions enables the identification of key feedbacks and trade-offs between environmental, social, political and economic factors (Ericksen, 2008).

At the deepest level sustainable agriculture is, like sustainable development, limited by the conceptual framework which supports it, with the relationship between people, planet and profits at its core. On the one hand agriculture can be interpreted as a logistics problem- how to equitably feed the world's population without comprising the biophysical apparatus of the planet. On the other hand, agriculture is an expression of the relationship between humans and their environment mediated through a need for sustenance- and the diversity of cultures that arise from it.

The movement towards agricultural sustainability depends on these different and often conflicting narratives surrounding food networks in the present and our vision for the future. It is not currently clear how the global techno-economic narrative that is dominant is either (i) energetically feasible or (ii) socially desirable as a blanket approach to agricultural sustainability.

It is not at all clear whether a post-growth future will maintain the high energy flows characteristic of fossil-fuelled globalisation for continuous technological development, or indeed for higher levels of governance to deploy policy and legislation interventions required to restructure agro-economic systems towards the theorised requirements for sustainability (e.g. Gibson, 2017). Nevertheless a dominant narrative of novel technological progress remains (Eisenstein, 2013; Harari, 2014), which presents itself as a barrier to the readoption or regeneration of older lifeways and patterns.

Geographical location and demography will largely play a critical part in determining post growth futures (Zeihan, 2022). Regardless of theoretical predictions, transitions towards sustainability emerge from current patterns and are entrained by historical pathways (path dependency). Individuals, families and communities will respond to local, regional and global events in idiosyncratic ways. Human societies are complex adaptive systems and as such respond unpredictably to the direct pressure of 'one size fits all' policies and legal instruments.

Against this theoretical background for the urgent need for agricultural transition, my research will attempt to unravel the complexities involved in the precipitous changes facing individuals and communities in Southern Ontario who live land-based livelihoods. We are entering a global food crisis triggered by multiple interacting factors including war and the price of fuel which has put pressure on

complex, and therefore fragile, global supply chains (Homer-Dixon et al., 2015; Zeihan, 2022). In Ontario, the amount of land being farmed has dropped by 45% since 1941, and the number of farms is continuing to fall with largely small or medium-sized farms disappearing. Only a few large farms benefit from the current policy environment (National Farmers Union, 2011). While economic barriers to farming such as profitability, access to labour and cost of supplies can be generalised to all farming communities, social barriers are context-dependent and include a lack of sense of community, mentorship and youth retention (Northern Ontario Farm Innovation Alliance, 2020). This points to a deeper crisis of farming and farm adjacent livelihoods which I propose to explore.

The dialectic between technological innovation and agroecological traditionalism is not new, spiralling as it has been since the advent of the horse drawn plough and tractor. “Back to the land’ movements have occurred sometimes out of necessity such as during the fall of Rome, or out of a desire to reject urban lifestyles for ‘The Good Life’ such as in 1960-70s North America (Nearing & Nearing, 1970) But Modernity is characterised by hard-won social freedoms for the individual that were unknown and possibly inconceivable to our ancestors. If rethinking sustainability as a transformation of core beliefs and values requires a return to local, communitarian, vernacular lifeways it may also mean a rollback of these freedoms- indeed it maybe a requirement. Therefore of principle interest to this thesis will be the values and ethics, expressed through multi-generational individual and collective narratives, that have shaped present day lives, and the key narratives that shape future visions of land-based life.

Research questions/objectives or hypothesis

(1 page): Outline your core research questions and/or objectives or hypothesis. Align questions/objectives/hypothesis with the core problem articulated above. Ensure subsequent sections of the proposal (literature review, methodology) refer back to and address these questions/objectives/hypothesis.

Research Questions

In a world facing the concatenating bio-physical, ecological and social crises of an Anthropocene modernity, food and farming systems exemplify the ‘wicked problems’ at the heart of sustainability transformations. Low technology, local, communitarian, socially decomplex, land-based livelihoods are re-appearing as part of a post-growth solutions.

1. What are the historical precedents for "back-to-the-land" movements, why did they emerge, what ethics and values did they embody, and what were the reasons for success or failure?
2. (a) What are the current patterns of socio-ecological systems around land, economy, and society in South-West Ontario? (b) What narratives of values and relationships typify these patterns? and (c) How would scenarios of global change impact these patterns, values and relationships.
3. What are the emerging themes and patterns from 1 and 2 that inform transitions to sustainability at different scales.
4. What narratives of social-ecological collapse and recovery emerge from the imaginations of individuals and communities working closely with the land.

Primary Objective

1. Examine the literature for evidence of historical 'back-to-the-land' movements, predominant narratives, and reasons for success/failure.

2. Explore patterns in narratives of current and future values and relationships in land-based livelihoods.
3. Critically analyse evidence from (1) and (2) against theoretical requirements of sustainability to determine the contribution of narratives of land-based livelihoods in local, regional and global transitions to sustainability.
4. Determine the predominant narratives of change amongst individuals and communities involved in land-based livelihoods.

3. Literature review and conceptual framework

(3-5 pages): Situate your research within the relevant scholarly literature; identify key gaps and limitations and set the foundation to justify your topic and your methodological approach. Work to develop a clear theoretical or conceptual framework for your research.

An outline of principal themes I anticipate underpin my thesis, and a sample of the key references for each follow. I will refine and fully develop these in the thesis as it unfolds. In addition, because I am taking an inductive approach, there are likely to be further areas which I explore as needed.

Sustainability-History and Principles

- Human activity has undergone a great acceleration due to advances in technology and the exploitation of easily available fossil fuels. Increasing and irreversible impacts on biophysical systems are occurring, including habitats and species loss, and climate change (Crutzen, 2002; Steffen et al., 2005).
- Limits to the growth in human activity were identified early in the 20th Century (Meadows et al., 1972) and have given rise to research into how societies might manage in a degrowth or post-growth world (Jackson, 2009, 2020; Meadows et al., 1972; Victor & Rosenbluth, 2007). Central to post-growth models is the idea of energetic limits based on entropy laws (Georgescu-Roegen, 1971).
- The Agenda for Sustainable Development developed as a global response to the Limits agenda (Reid et al., 2005; United Nations, 2015; WCED, 1987)
- Planetary Boundaries and 'Limits' approaches (Campbell et al., 2017; Folke et al., 2011; Leach et al., 2013; Raworth, 2017, 2018; Steffen et al., 2015)
- General Requirements for Sustainability (Gibson, 2017)

The sustainability project can be framed as the need to re-couple the anthroposphere within the biosphere and a choice between accepting constraints or stepping in to manage the system (Kish & Quilley, 2021a). The Eco-modernist approach rejects limits to growth and maintains that "*a good Anthropocene demands that humans use their growing social, economic, and technological powers to make life better for people, stabilise the climate, and protect the natural world*" and further that "*intensifying human activities is the key to decoupling human development from environmental impacts*" (Asafu-Adjaye et al., 2015; Nordhaus et al., 2012; Symons & Karlsson, 2018). In opposition, a collection of post-growth movements more fully embrace constraints and explicitly reject growth. These include degrowth (Kallis, 2010, 2011; Kallis et al., 2012; Schneider et al., 2010), steady-state economics (H. E. Daly, 1980; Kerschner, 2010) and ecological economics.

Economics in Post-Growth World

Until the end of the medieval period, most economic thinking was geared towards more holistic ends-towards the glory of God(s) or the sustenance of God-King-Lord-Farmer-Serf's chain of existence extolled by Plato, Augustine and later Aquinas (Hunt & Lautzenheiser, 2011). However, the vision of household governance as a means to an end (e.g. Xenophon's *Oeconomicus*) shifted to a search for general laws of the science of economics, such as those developed by Walrus and Jevons.

Polanyi demonstrated the economic system is embedded as a component of human culture, and like culture is in a constant state of evolution (Polanyi, 1957). The reduction of economics to mechanisms of, for instance, supply and demand, emerging synchronously with shifts in the workplace from the home to the factory, heralded a disembedding of the economy from long-standing cultural relationships.

Since the 20th Century, Capitalism has emerged as the most lasting political economy. It has brought enormous and unprecedented success in the alleviation of poverty and technical innovation, but Capitalism's central mechanism of growth is sustained in the face of mounting evidence of ecological and social degradation (Crutzen, 2002; H. E. Daly & Farley, 2010). Continuing criticisms of capitalist-based economics have led to a profusion of heterodox economic theories, including steady-state economics (H. E. Daly, 1980), environmental economics, feminist economics, degrowth, ecological economics (H. Daly & Farley, 2004), doughnut economics (Raworth, 2018) and complexity economics (Arthur, 2021)

Ecological Economics

The emergence of ecological economics in the 1980s came about because environmental and resource economics failed to address social-ecological aspects in economic models but rather attempted to internalise externalities as natural capital (Costanza et al., 1997, 2020; H. E. Daly & Farley, 2010; Røpke, 2004, 2005; Spash, 1999). From its beginning, EE has sought to re-couple thinking about the biophysical and moral/ethical constraints (Costanza et al., 1997; H. E. Daly & Farley, 2010; Spash, 1999, 2012) and combine academic disciplines into a more holistic approach (Costanza et al., 1997). Perspectives from systems science helped to reposition the economy at the centre of society, which is embedded within natural ecosystems. EE builds on the re-establishment of economics based on biophysical principles, particularly the material and energy flows of production and consumption. Classical economics sees the economy as an open system, which assumes a constant influx of materials and energy and output of waste. An open system has no opportunity costs- the loss of one choice when another is taken. However, the earth as a whole system approximates a closed system, where only energy passes through (in as sunlight and radiated as heat) (Georgescu-Roegen, 1971); the transformation of physical resources to goods, therefore, comes at a high and irreversible cost. The consequence of this is a rejection of continuous growth as a mechanism for driving prosperity and an acceptance of *social and ecological limits* (Jackson, 2009; Rockstrom, 2009; Victor & Rosenbluth, 2007)

Over most of the course of evolution, humans have relied on short-term stores of solar energy in the biosphere to power their endeavours, for instance through fire, or plant and animal material. With the discovery and use of fossil fuels with a high energy return on investment, access to increased energy flows enabled a stark increase in social complexity (Christian, 2011; Kish & Quilley, 2021a). A central criticism of the Sustainable Development Goals from Quilley and Kish is that they rely on a sustained high throughput of energy for their delivery through a complex society (Kish & Quilley, 2017, 2021a; Orr

et al., 2020; Quilley, 2011; Quilley & Kish, 2019). This may mean that cherished and hard-fought freedoms are not compatible with shifts to a low-energy future (Ophuls, 2011; Quilley, 2013). Kish and Quilley further argue after Rifkin (2009) that global emergence of eco-centrism and empathy are associated with high transformity values¹- i.e. they are the result of increased social complexity- which will have repercussions for social-ecological change. However ecocentrism is a characteristic of low technology indigenous peoples (Kimmerer, 2013; Yunkaporta, 2020), and nodes of persisting complexity are theoretically possible (Keynes, 1936; King & Jones, 2021).

Social Complexity

As previously mentioned, Polanyi demonstrated that the economic system is embedded as a component of human culture and both are constantly evolving (Polanyi, 1957). The movement of classical economics into a quantitative mathematical science undermined historical perspective, specifically this co-evolutionary process (H. E. Daly & Farley, 2010). Kish and Quilley argue for a political economy that centres on the co-evolved duality between the biosphere, the economy and society characteristic of a 'Modernity' narrative (Kish & Quilley, 2021a). Two key features in the modern capitalist economy are:

- Markets are essential for growth but undermine the welfare of workforce and thus require "countervailing protection" (Polanyi, 1944)
- Protection comes from the state rather than family or community

Of critical importance within this narrative is:

- The rise of the sovereign individual at the expense of the community;
- An apparent tension between the market and the state;
- The state cannot take up the loss of market because the state depends on the market for taxation;
- Livelihood emerges as a low-energy alternative to market and state;
- Market-driven processes of instrumental rationalisation in which culturally construed; cosmological, and ontological 'ends' are subordinated to technical 'means;'
- Tension between the abstract, rationalised space of the disembedded formal economy and the concrete, contextual, particular places of the informal economy;
- Communitarianism

There are marked differences between the traditional and modern economies in social complexity (Kish & Quilley, 2021a). Any post-growth re-coupling of the biosphere and society within a narrative of limits will see a shift in these social relationships (Table 4). What remains to be seen is whether a priori transitions are possible through scaled policy changes or whether these will occur as an adaptive response to resource scarcity and the resulting social process. A fundamental shift in perception around the nature of modernity is required.

¹ Odum developed an energy accounting framework using the accumulated energy of the material and embodied relations of a range of social and cultural artefacts as a transformity value (Odum, 2007), which allows a deep analysis of the trade-offs between competing ends (Kish & Quilley, 2021b)

TABLE 1 COMPARISON OF TRADITIONAL, MODERN AND POST-GROWTH ECONOMIES

Traditional Economy	Modern Economy	Post-Growth Economy
Primary relationships	Secondary relationships	Shift back to primary relationship while maintaining significant secondary relationships around security health (pandemics) and environmental protection (climate change)
Small communities	Urbanization	De-urbanization
Religious States	Secular States	Re-enchanted States
Obligation	Freedom	Communitarian
Homogenous	Multicultural	Scale-dependent
Reciprocal	Exchange	Local Reciprocal, Global exchnage
Pre- Industrial	Industrial	Livelihood

One point of confluence is a growing interest in, and calls for, more qualitative approaches across heterodox economics, including feminist economics (e.g. Tejani, 2019) and indigenous economics (e.g. Colbourne et al., 2020; Hilton, 2017). In particular, the importance of stories and narratives in economic systems is of growing interest. Narratives need to restore an understanding of how individuals fit into a complex unified reality.

"Agents recognise the current state of the game (patterns) and associate appropriate moves with thatModern psychology shows us how agents use narratives, imagination and calculations to make sense in ill-defined circumstances" (Arthur, 2021, pp. 137–138).

Land-based Livelihoods within a Historical and Economic Framework

Very simplistically, land-based livelihoods, including hunter-gathering and agriculture, were originally solutions for families, tribes and small communities to meet their daily energetic needs (See Graber and Wengrow for a full account (Graeber & Wengrow, 2021). With the advent of agriculture, it was possible to generate a surplus to store and thus trade food and other land-based resources with others. Agriculture reduced the mobility of people and facilitated their concentration in settlements and later cities, but instigated divisions of labour where more people were working away from direct contact with the land, supported through taxation (H. E. Daly & Farley, 2010).

Until relatively recently, all livelihoods were land-based in that they had a direct physical connection to working on and with the land. Traditionally, the dominant cultures supported by economies derived directly from agricultural work. This meant agriculture defined their ways of being and learning, which were bound with intimate knowledge of how the land works, where to find food and water, how to

avoid danger, and where to build a house. Traditional ceremonies and rituals were based on annual solar and lunar cycles influencing growing patterns and defining times for activity and rest.

Technology, particularly the large scale availability of first steam and then fossil-fuelled engines, 'freed up' agricultural labour to work in cities. At the same time, developments in economics saw its rise as a social science with its own theories of efficiency that undermined the idea of the economy as being in service to anything but itself, a process described by Polanyi as 'disembedding' (Polanyi, 1957).

Within a framework of limits, particularly energetic limits, without the discovery of an environmentally friendly energy source to replace fossil fuels, realistic planning for a post-growth future lies in low-energy solutions. Unfortunately, the global food system is currently a massive user of energy.

The current agricultural system is globalised and lacks resilience- how is it meeting people & planet?

Conventional intensive agriculture is the prevailing food production paradigm and is characterised by industrial management of livestock or large-scale monocultures with high external inputs and mechanisation that circumvent many of the ecosystem limits to production (Vanbergen et al., 2020)

Agriculture today is seen as both a major contributor to biophysical impacts and a major pathway for transitions to sustainability e.g.:

- Food systems contribute 19%–29% of global anthropogenic greenhouse gas (GHG) emissions, releasing 9,800–16,900 megatonnes of carbon dioxide equivalent (MtCO₂e) in 2008. Agricultural production, including indirect emissions associated with land-cover change, contributes 80%–86% of total food system emissions, with significant regional variation. (Vermeulen et al., 2012)
- Agriculture production as a major driver of exceeding planetary boundaries (Campbell et al., 2017)
- Keeping Food Systems within environmental limits (Springmann et al., 2018)

As an example of land-based livelihoods, traditional agriculture has been under attack since the mid 20th Century as technology enabled larger farms with fewer employees. Agriculture is seen as a major impact on the environment, such that many have called for a huge reduction in the land area under farming, so-called land-sparing (Monbiot, 2022). This can only be achievable by increased urban populations served by massive high tech farms or new food technologies.

Others argue that agriculture has a critical role to play in combatting climate change through restorative or regenerative practices (Perkins, 2019; Shepard, 2013). Chris Smaje presents a vision for re-ruralization or a 'small farm future' which relies on the skimming of widely distributed solar energy (Smaje, 2020); however, it is steadfastly ignored because of perceptions of backwardness in a progress-orientated society (Smaje, 2020). Regenerative practices not only describe farming practices such as no-till ploughing and reduced fertiliser use but also describe a shift away from an anthropocentric, resource-use to a more ecocentric, reciprocal relationship with land

4. Ontological and Epistemological Basis for Research

Holism vs Reductionism

My research rests on the position that sustainability is, at its heart, a problem of perception. The Enlightenment was a correction to religious and subjective ontologies that had come to dominate

thinking. It refocused on a reductionist, mechanistic, quantitative epistemology which has sought to define existence in terms of essential material structures and laws. However, this has led to the exclusion of a holistic, organic and qualitative view. Moreover, this may result from underlying biases in our brain's bi-hemispheric structures (McGilchrist, 2009). While reductionist approaches may be the most appropriate for revealing the properties of and working with problems of non-living materials, its not a good fit to understand and work with the complexity of living systems (Berman, 1989; Capra, 1997; Capra & Luisi, 2014; Eisenstein, 2013).

Social Constructionism (Intepretivism)

Established ontological and epistemological positions for research include positivism and social constructionism (interpretivism). Positivists assert an objective reality exists and knowledge comes about by the reductionist observation and quantitative measurement of smaller and smaller parts which together add up to the whole; crucially, theories are formed which are tested against collected quantitative evidence in a deductive approach. Social Constructionists (Interpretivists) seek the meaning of individual and collective experiences of phenomena where reality is found in the diversity of lived experience. Evidence can be quantitative but is usually qualitative and themes and concepts emerge through an inductive process (Creswell & Creswell, 2017).

Systems Thinking and Complexity

The emergence of systems thinking in the early 20th Century (e.g., Ashby, 1947; Bertalanffy, 1968; Midgley, 2015) and complexity theory in the 1990s (Capra, 1997; Levin, 1999) has amounted to a paradigm shift in our understanding of the structure and function of our world and how we might influence it.(Capra, 1997; Capra & Luisi, 2014). It has further challenged the simplistic assumptions of growth-based economics and requirements for sustainability. Natural and social systems are complex systems themselves, but many economic questions involve linkages between social and ecological systems (Berkes et al., 2003). Moreover, a shift towards sustainability requires transformations that fundamentally alter human and environmental interactions and feedback (Walker et al., 2004). There has been a rise in interest in applications of systems thinking and complexity to social problems and interest in frameworks and tools to support this (Midgley, 2000; Stroh, 2015). Midgley proposes methodological pluralism which draws upon many methods, some with very different ontological and epistemological assumptions. The result is that observation becomes inseparable from intervention, and what scientists have customarily seen as research “becomes part of an intervention practice” (Midgley, 2000, p. 7).

Narrative Inquiry

From an interpretivist ontology, I have chosen to focus on narratives as a critical component of human sensemaking and behaviour.

"Narrative is a scheme by means of which human beings give meaning to their experience of temporality and personal actions. Narrative meaning functions to give form to the understanding of a purpose to life and to join everyday actions and events into episodic units. It provides a framework for understanding the past events of one's life and for planning future actions. It is the primary scheme by means of which human existence is rendered meaningful." (Polkinghorne, 1988, p. 1)

Narrative Research, or Narrative Inquiry, is a qualitative research method that focusses on individual's experiences through their stories (Riessman, 2008), which is then often retold by the researcher, and can combine elements of the researcher's life in a collaborative narrative (J. D. Clandinin & Connelly, 2000). Developments of narrative approaches by Kurtz and Snowden (C F Kurtz & Snowden, 2007; Cynthia F. Kurtz, 2014) assists the co-created negotiation of meaning. Snowden has further developed this as a method for 'mass sensing' of systems as a way to work with complexity (Snowden, 2005). I will further develop the background to narrative inquiry where it has emerged through phenomenology (Husserl, Heidegger), hermeneutics (Heidegger, Gadamer, Ricoeur), philosophy of language (Bakhtin), ethnography (Gertz), psychology (Vygotsky), pragmatism (Dewey, Rorty). I will position the narrative approach as sits within systems thinking with related practices of organizational theory and knowledge management (Braun, 2002; Senge, 1990), systems intervention (Midgley, 2000), soft systems methodology (Checkland & Poulter, 2010), action research (Freire, 1970; Whyte, 1991) and Narrative Ecology (Donaldson, 2022, Pers. Comm.: Gabriel, 2016, 2021)

5. Methodology and methods

(i.e., research design) (3-5 pages): Establish the philosophical and epistemological foundations for your work and situate your choices about methods and tools for data collection, analysis and synthesis. Clearly outline specific methods, highlighting their strengths and limitations with regard to your research specifically. Indicate the relationship among your data collection and analysis plans and your research objectives/hypotheses, and any assumptions you are making in the process.

While there is a theoretical and conceptual background developing around post-growth agricultural systems and livelihoods, my approach will be to seek patterns in the narratives of research participants and develop themes and concepts which will be compared to published theories about the requirements for sustainability, particularly through an ecological economic lens (e.g. Kish & Quilley, 2021b; Spash, 2012).

As described in Section 3.0 above, my approach will therefore be inductive and based on Narrative Inquiry (D. J. Clandinin, 2007; J. D. Clandinin & Connelly, 2000; Riessman, 2008) and further developed using an action research approach as Participatory Narrative Inquiry (Cynthia F. Kurtz, 2014; Cynthia F Kurtz & Snowden, 2009). While some researchers maintain that Narrative Inquiry and Action Research are distinct qualitative research methods (Creswell et al., 2007) others have emphasised the interrelationship in "research that results in action or change in the practices of individual researchers, participants, and institutional practices" (Pushor & Clandinin, 2009)

Question 1: What historical precedents exist for "back-to-the-land" movements, why did they emerge, what ethics and values did they embody (narratives), and what were the reasons for success (full or partial) or failure?

Research Justification

The current interest in 'BTTL' lifeways is not a new phenomena. Early civilizations had periods of urbanization followed by a return to the land for economic, political or environmental reasons such as following the collapse of the Roman Empire (Fernández-Götz, 2016; Graeber & Wengrow, 2021; Moore & Fernández-Götz, 2022). A desire to escape civilization is a constant thread from as early as The Epic of Gilgamesh in 2100 BCE (Tuan, 1975). Re-appearances of the phenomena include the Arts and Crafts Movement (1880-1920), the Swedish Home Craft Movement, the Hippie Movement in the 60-70s (Hofverberg et al., 2017). Movements that directly respond to the current sustainability crises include the Transition movement (1990s) and Doomer Optimism (2021).

The review will provide data for comparing the conditions for emergence, embodied values and ethics, and reasons for success/failure in historical movements with those from interviews and participatory work.

Approach: Literature Review

There are many approaches to undertaking a literature review (Creswell et al., 2007; Creswell & Creswell, 2017; Paré et al., 2015). I am taking an inductive approach with my research so I will undertake a theoretical literature review which will draw on existing studies to provide a framework for identifying patterns and themes that might be transformed into a higher order theoretical structure or conceptual framework (Paré et al., 2015)

Question 2. (a) What are the existing patterns of socio-ecological systems that emerge at the intersection of land, economy, and society in South-West Ontario and (b) how would the likely scenarios of global change impact these patterns, values and relationships?

Research Justification

Change in social-ecological systems is path-dependent, i.e. the direction of change is a function of the system's past and current structure and function. While it may be desirable to transition to sustainable patterns, speed, extent and success of change will depend on the current configuration. Therefore, to establish whether land-based livelihoods are likely to meet theoretical goals for transitions to sustainability, we must (1) describe and (2) understand existing patterns.

I am interested in exploring the values and ethics that underpin an individual's livelihood choices; however, I expect a difference between these and the emerging pattern in a social context. For this reason, I will adopt two different methods of inquiry: individual semi-structured interviews and participatory work groups. Furthermore, to understand where values and ethics conflict and possible

adaptive solutions, the work groups will be structured where participants are from similar backgrounds and different backgrounds.

While the 30 interviews and group work will offer some insight into local land-based livelihoods, understanding variation in patterns across larger scales is desirable. Therefore, a third method will be to use a "mass sense" approach offered by the Sensemaker platform. The flexibility of this tool allows the collection of a large amount of anonymous data to reveal broader patterns.

Future Scenarios

Interviewees will be asked to describe in qualitative terms their responses to three different future scenarios, adapted from the Rupert Read's Why Climate Breakdown Matters (Read, 2022)

- Dodo-collapse with no civilization emerging.
- Phoenix- a successor civilization emerges after a collapse.
- Butterfly- transformation of civilization without collapse.

Approach1: Semi- Standardized (Structured) Interviews

Semi-Standardized (Structured) Interviews (Lune & Berg, 2017) will form the basis for data collection. Following the recommendations based on grounded theory (see sample size below) approximately 30 interviews will be conducted with individuals in Ontario who fully or partially meet their livelihood needs by working on or with the land as a food resource or supporting those that do. This will include but not be restricted to farmers, farmworkers, homesteaders, allotment owners, land skills teachers, blacksmiths (tools), farriers (horses) and shepherds/stockpersons.

Questions will be aimed at capturing an idea of a baseline, problems, and solutions. In keeping with the inductive nature of this research, and with the focus on identifying key narratives, broad prompts rather than specific questions are preferred but these may be used if necessary.

Example Questions

- Tell me a story about your livelihood today? (Baseline)
 - How would you define your work?
 - Would you define you work as separate from your personal life?
 - How do you see the relationship to the land you work on? (resource vs cultural/spiritual)
 - Did anyone else do this work in your family before? (succession)
 - Does your work confer any community status?
- How do you think your livelihood became what it is today? (Problems)
 - What are the biggest influences on how you work?
- Tell me a story about what farming will look like in the future? (Change/Solutions).
 - Would you want your children to do this work? (Succession)
 - What are the main reasons you would change your farming practices?
- What, if anything, would cause you to change your practices to align with:
 - reduced/ greater technology use
 - reduced/greater fertilizer use
 - mixed vs single cash crop farming
 - local vs regional/global markets
- How do you see the following factors affect your farming?:

- increase in fuel prices
- climate change
- Participants will be asked to describe a narrative their work under three different future scenarios of social and ecological collapse
 - (1) "Dodo" Collapse without a significant recovery
 - (2) "Phoenix" Collapse and recovery
 - (3) "Butterfly"- Gradual transformation towards a climate resilient future

Approach 2: Local Land-based Livelihoods Participatory Narrative Inquiry (PNI) Sessions

Social patterns are co-constructed, so while individual interviews are useful in gauging the diversity of narratives in play, they do not indicate their fitness in a social context. Using participatory narrative inquiry, interviewees will be invited to attend workshops with groupings based on their responses to interviews. Possible groups will be based around low vs high tech livelihoods, individual vs communitarian values, land sparing vs land sharing ethics. 3 workshops will be conducted, one for each group and one inter-group workshop.

During the workshops, attendees will be asked to share their narratives following a [Future Backwards](#) (Backcasting) format to develop a 'rich picture' of the issues around livelihood. This method is particularly useful for discovering:

- what entrained patterns of past perception are determining its future
- comparing and contrasting different aspirations for the present and the future
- generate multiple turning points or decision points
- generate or prompt for anecdotes, to lead into mapping and many other purposes.

Furthermore, the inter-group workshop will be used to highlight areas of confluence, conflict and possible resolution around e.g high tech vs low tech livelihoods

Participatory Narrative Inquiry

PNI is a participatory method developed by the PNI Institute <https://pni2.org/> which incorporates the Back-casting process developed by Cognitive Edge <https://www.cognitive-edge.com/>. It is

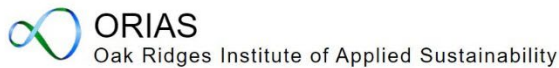
- PARTICIPATORY-Everyone Engaged
- NARRATIVE-Creating and exploring Stories and their Form.
- INQUIRY-Group makes sense of outputs themselves without direction.

Typically, a session is undertaken in a shared space such as schoolroom or church hall and work is undertaken with hex-shaped cards or post-it notes. In current circumstances however where such gatherings are prohibited, the action occurs in a virtual space such as Zoom <https://zoom.us/> coupled with a virtual whiteboard e.g Miro <https://miro.com>

A typical session involves the following stages:

- Choose topics and dates.
- Describe situation at ending date.
- Work backwards to starting date.

- Identify Turning Points:
- Problems, Decisions, Dilemmas, Learning Moments, Times of Joy/Despair, Times of Solidarity or Conflict, Breakthroughs, Accidents, Surprises.
- Add Descriptors-beliefs, feelings, motivations, forces, goals, fears, hopes, capabilities, deficiencies, resources, connections.
- Answer questions about stories.
- Visit Timelines of other groups
- Describe Heaven (work Backwards).
- Describe Hell (Work Backwards).
- Identify 3 “Killer Steps” As a basis for action.
- Identify Benefits of Heaven
- What are the themes of the Benefits
- What projects & initiatives might work from the Themes? (On a separate Sheet).
-



#RESILIENTPALGRAVE

Workshop 1.1
Wednesday 24th March 2021
7-9:20pm



Figure 1: A typical PNI Narrative Map and Action Table

Approach 3: Sensemaker

The Cognitive Edge SenseMaker® tool is one method for capturing and making sense of people's attitudes, perceptions, and experiences. It is used for monitoring and evaluation; mapping ideas, mind-sets, and attitudes; and detecting trends and weak signals. However, academic literature describing the

tool-set and method is lacking (Van Der Merwe et al., 2019). Cognitive Edge describes SenseMaker® as consisting of "Frameworks (a project designed to collate, interpret, and report on data with a specific purpose) and Engagements (a "questionnaire" or set of questionnaires designed to collect the required data for a specific Framework). Respondents contribute to Frameworks by completing an Engagement on a web or App-based Collector" (The Cynefin Co, 2022)

Figure 1 represents the quantitative results of a research project. "The red dots and contours represent the patterns of real responses (how the system is currently disposed). The teal dot represents the desired direction. It is clear that the results show two distinct groupings / peaks in the top left and bottom right of the landscape. The grey arrows indicate the direction towards the "adjacent possible" - small groupings of stories or observations that are already present in the system and therefore can be amplified in order to evolve the system in a beneficial direction, much like "crossing a river with stepping stones" rather than attempting to cross in one big leap" (The Cynefin Co, 2022)

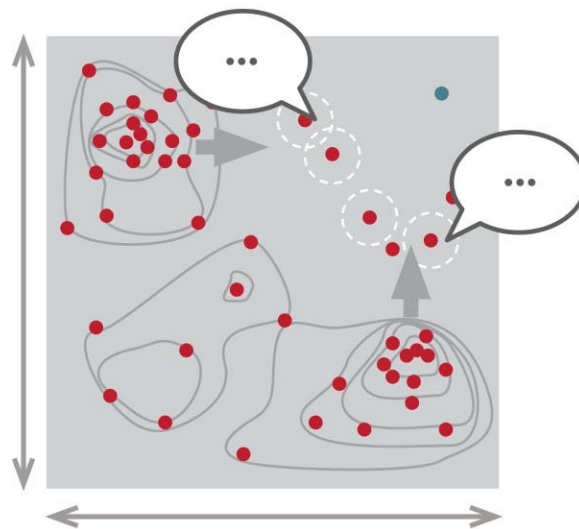


Figure 2: Quantitative results from a Sensemaker Research Project

Stories are typically collected anonymously, but this project will facilitate collective sensemaking by sharing the results from the exploratory analysis with participants in a workshop setting (Van Der Merwe et al., 2019)

Question 3: What are the emerging themes and patterns from 1 and 2 that inform transitions to sustainability at different scales?

Research Justification

As established above, change in social-ecological systems is path-dependent, i.e. the direction of change is a function of the system's past and current structure and function. While it may be desirable to transition to sustainable patterns, the speed, extent and success of change will depend on the current configuration.

Approach

A critical analysis of evidence from (1) and (2) will be undertaken to determine the contribution of land-based livelihoods to local, regional and global transitions to sustainability.

Research Methods Summary

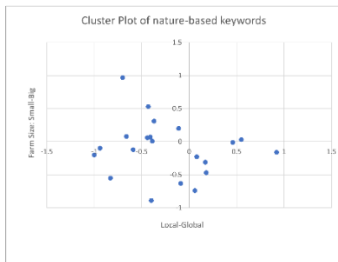
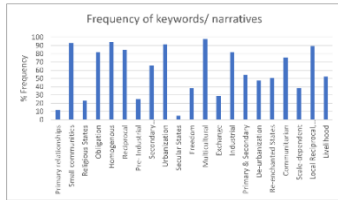
Table 2 Research Methods Summary Table

RESEARCH METHODS SUMMARY TABLE									
Interviews (Individual Narratives)			Participatory Work (Collective Narratives)				Sensemaker (Widely Distributed Narratives)		
Narratives Prompts									
Key Words and Narrative Responses	Tell me a story about your livelihood today	How do you think your livelihood became what it is today? (Problems)	Tell me a story about what your livelihood will look like in the future? (Change/Solutions?).	Where Are We Now	How did we get Here	Utopia/ Distopia	Tell me a story about your livelihood today (See Fig 1)	How do you think your livelihood became what it is today? (Problems)	Tell me a story about what livelihood look like in the future? (Change/Solutions).
Patterns	e.g. State vs Society Succession, Small Communities Size Relationships (primary vs Secondary, Reciprocity vs Exchange, Livelihood, Payed Work		<p>Method: Coding of participatory outcomes with key words and narratives to look for themes and patterns</p>				<p>Method: Self-signification of narratives to reveal ethics and values behind them . Potential 'mass-sensing' if enopugh respondents.</p>		
Processes	e.g. Globalisation, Urbanisation, Technology, Progress, Industrial vs Pre-industrial, Enchantment								
Values	e.g. Hard Work, Family Values, Gender Roles, Individualism, Liberalism, Conservatism, Environmentalism, , Allegiance, Religious vs Secular, Obligation vs Freedom, Communitarian, Vernacular								

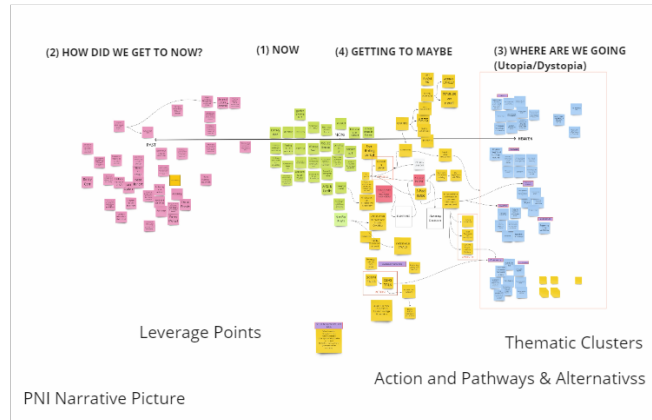
Differences in narratives between individual and group responses

Example Outputs

Individual interviews



Participatory Workshops



Sensemaker

Contium (Dyad) and Three dimensional fitness landscapes (Triad) plots reveal patterns of sensemaking and action in individuals and are further validated by 'retuning' data to community. If used as a 'mass sensing' tool (1000+) would be useful to theorize on basis of scale.

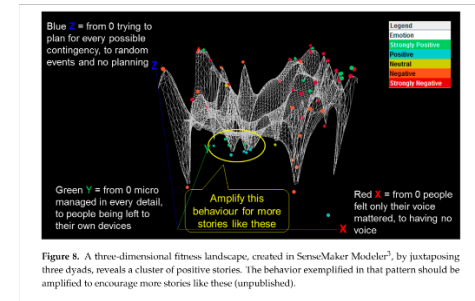
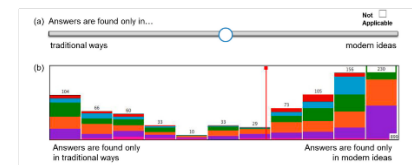


Figure 8. A three-dimensional fitness landscape, created in SenseMaker Modeler², by juxtaposing three dyads, reveals a cluster of positive stories. The behavior exemplified in that pattern should be amplified to encourage more stories like these (unpublished).

Figure 3: Example outputs from the Research Methods

Sample Size

Sample size depends on the qualitative design being used (Creswell & Creswell, 2017, p. 186). Narrative includes one or two individuals; phenomenology involves a range of 3–10; grounded theory, 20–30. Charmaz (2006) said that one stops collecting data when the categories (or themes) are saturated: when gathering fresh data no longer sparks new insights or reveals new properties. The sample size for the online story collection through Sensemaker is 300, based on the minimum requirement stipulated by Cognitive Edge. This heuristic allows one to disaggregate the data based on subgroups while still maintaining at least 50 stories per subgroup. A minimum of 300 stories per site also provides enough data points to allow patterns to emerge on visual scanning of the triads, dyads and stones (Bakhache et al., 2017).

Study Sites

The interviews and group work will take place in Southern Ontario. The online Sensemaker project will be open to any participant regardless of their location.

Recruitment

Participants will initially be recruited through the following locations and organisations.

- Farmers Markets Ontario <https://www.farmersmarketsontario.com/find-a-farmers-market/>
- National Farmers Union
- Ecological Farmers Association of Ontario
- Ontario Rural Skills Network
- Craft Ontario
- People Archive of Rural Ontario
- Headwaters Food and Farming Network
- Ontario Federation of Agriculture
- Toronto Food Terminal
- Rural Ontario Institute <https://www.ruralontarioinstitute.ca/>

Benefits for Participants

The primary focus of this research is to reveal some of the narratives that shape the lives of people working with the land in Canada. Many people will be aware of the narratives that shape their lives, and some will have an understanding and perhaps empathy with narratives not their own. Others however will be unaware of the power of narratives, and by working with individuals and groups during my thesis, my aim is to help participants uncover and work with their narratives and use that knowledge and understanding to develop visions for resilience in a changing future.

The thesis focuses on the role individual and collective narratives play in sensemaking and action planning process in the context of transitions toward sustainability, including social change and climate change mitigation and adaptation. Individual interviewees will be inducted to the project as part of this process, and all participants will receive feedback on the overall themes that emerge from the project. Most participants will be invited to participate in local Participatory Narrative Inquiry (PNI) sessions where individual narratives will be explored in a collective context and opportunities and barriers for

sustainability transitions and community resilience building will be explored. Outcomes from the PNI can be taken forward as a community action plan for a sustainable and resilient future.

6. Expected outcomes and contributions

(1-2 pages): Identify and discuss the expected outcomes and novel contributions you hope to make – these can be theoretical, empirical and/or focused on applied or policy contexts. If you are planning to follow a dissertation by manuscript format (see guidelines below), tentatively outline the expected focus of the three main manuscripts.

The inductive nature of this research presents difficulties in fully outlining the outcomes and its contributions, some of which will emerge as each element is undertaken.

Expected Outcomes

As outlined above, there is a general recognition that the human relationship with land and food is at the heart of the sustainability crises, and transitions towards sustainability are needed. However, requirements for sustainability are diverse and suffer from competing visions of what a sustainable future might look like. Moreover, the pathways toward these goals are often framed in terms of policy interventions or legislation without a clear understanding of how these tools work on complex adaptive systems.

Set against this dilemma, this research will

1. Provide a review of the historical precedents that exist for "back-to-the-land" movements, why did they emerge, what ethics and values did they embody (narratives), and what were the reasons for success (full or partial) or failure.
2. Present a "rich picture" of individuals and communities engaged in land-based livelihoods in Southern Ontario through collected narratives, highlighting themes and areas of conflict.
3. Provide a narrative-derived description of likely adaptation pathways to predicted future socio-ecological shocks.
4. Through participatory workshops focussing on co-created narratives, develop community awareness of common narratives and develop action plans towards a sustainable and resilient "adjacent possible".
5. Provide analysis of the opportunities and constraints with regards to food systems transition and a discussion on the validity of theoretical aspirations for sustainability.

Novel Contributions

Narrative Inquiry is an established qualitative research methodology especially used in the field of sociology and in more recently in organisational research, but its application to social-ecological systems research and particularly ecological economics is limited. Narratives offer insight into understanding and working with complex systems (C F Kurtz & Snowden, 2007) and can help gain a richer understanding of social-ecological conflicts, navigate multiple ways of knowing and manage contested visions (Vigliano Relva & Jung, 2021).

This research will add important depth of knowledge about the current and adjacent possible narrative landscapes of Southern Ontario. Amongst other factors this area has a diverse and increasingly

urbanised and growing population, a legacy of colonialism, and reliance on immigration to address demographic imbalances, where the ability for communities to navigate conflicting and competing narratives is of critical importance for sustainability.

7. Schedule of activities

(1 page): Provide an expected schedule of tasks and activities starting with proposal approval and ethics clearance, through to expected timelines for first drafts and proposed defense date.

Phase	09/22	10/22	11/22	12/22	01/23	02/23	03/23	04/23	05/23	06/23	07/23	08/23	09/23	10/23	11/23	12/23	01/24	02/24	03/24	04/24	05/24	06/24	07/24	08/24	09/24
Thesis Proposal/Approval	█	█																							
Phase 1																									
Ethics 1	█	█																							
Participant Recruitment	█	█	█																						
Literature Review	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Interviews				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Participatory Workshops				█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Sensemaker Design		█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Sensemaker Live					█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Data Analysis						█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Phase 2																									
Ethics 2 (if required)										█	█														
Further fieldwork											█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Data Analysis																									
Write-Up										█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Defense																									

8. Data Management

A Data Management

9. Budget and Funding

Budget

Budget	\$	
-		
Sensemaker Licence	1,500	
Workshops x 3	500	
Research Assistant (Translation)	3,000	(100 hrs)
Travel	500	
Invivo Licence	598	(1 year)
TOTAL	6,098	

Funding

No funding has been secured currently but conversations with various NGOs are underway.

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