

Adger, W. N. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography* 24(3), 347-364.

This article defines social resilience as the ability of groups or communities to cope with external stresses and disturbances as a result of social, political and environmental change. This definition highlights social resilience in relation to the concept of ecological resilience which is a characteristic of ecosystems to maintain themselves in the face of disturbance. There is a clear link between social and ecological resilience, particularly for social groups or communities that are dependent on ecological and environmental resources for their livelihoods. But it is not clear whether resilient ecosystems enable resilient communities in such situations. This article examines whether resilience is a useful characteristic for describing the social and economic situation of social groups and explores potential links between social resilience and ecological resilience. The origins of this interdisciplinary study in human ecology, ecological economics and rural sociology are reviewed, and a study of the impacts of ecological change on a resource-dependent community in contemporary coastal Vietnam in terms of the resilience of its institutions is outlined.

Alexander, D. E. (2013). Resilience and disaster risk reduction: An etymological journey. *Natural hazards and earth system sciences* 13, 2707–2716.

This paper examines the development over historical time of the meaning and uses of the term resilience. The objective is to deepen our understanding of how the term came to be adopted in disaster risk reduction and resolve some of the conflicts and controversies that have arisen when it has been used. The paper traces the development of resilience through the sciences, humanities, and legal and political spheres. It considers how mechanics passed the word to ecology and psychology, and how from there it was adopted by social research and sustainability science. As other authors have noted, as a concept, resilience involves some potentially serious conflicts or contradictions, for example between stability and dynamism, or between dynamic equilibrium (homeostasis) and evolution. Moreover, although the resilience concept works quite well within the confines of general systems theory, in situations in which a systems formulation inhibits rather than fosters explanation, a different interpretation of the term is warranted. This may be the case for disaster risk reduction, which involves transformation rather than preservation of the “state of the system”. The article concludes that the modern conception of resilience derives benefit from a rich history of meanings and applications, but that it is dangerous – or at least potentially disappointing – to read too much into the term as a model and a paradigm.

Amundsen, H. (2012). Illusions of resilience? An analysis of community responses to change in Northern Norway. *Ecology and Society* 17(4), 46.

This article contributes to our understanding of community resilience. Community resilience is the ability of a community to cope and adjust to stresses caused by social, political, and environmental change and to engage community resources to overcome adversity and take advantage of opportunities in response to change. Through an analysis of local responses to multiple challenges, six dimensions of community resilience were found in one village in northern Norway. These dimensions; community resources, community networks, institutions and services, people–place connections, active agents, and learning; are activated in processes and activities in the village to respond to current challenges. Although this corroborates findings from other community resilience research, this research suggests that community resilience is both complex and dynamic over time.

Although communities may consider themselves resilient to today's challenges, the rate and magnitude of expected systemic global changes, especially climate change, means that future resilience cannot be taken for granted. This work concludes that there is a risk that community resilience may be an illusion, leading to complacency about the need for adaptation to multiple factors of change. Hence, the ability of communities to actively engage in reflexive learning processes is of importance for both adaptation and future resilience.

Amundsen, H. (2013). Place attachment as a driver of adaptation in coastal communities in Northern Norway. *Local Environment* 20(3), 257-276.

Changes in a range of interlinked factors, in social, economic, environmental and climatic conditions, require adaptation in many communities. This paper explores how place attachment affects adaptive responses to a changing social context through analysing adaptation in two coastal municipalities in Northern Norway. The main challenge in these municipalities is declining populations and the consequences accompanying this trend, including livelihood uncertainties and decreased provision of public services. This paper discusses the role of place attachment in motivating adaptation to these changes to contribute to a growing body of literature within climate change adaptation on "subjective" (values, culture and place) dimensions. The findings suggest that people are motivated to act based on their emotional connection with place, and the paper argues that place attachment may offer a better starting point for climate change adaptation than an emphasis on climate change impacts.

Ashmore, F. H., et al. (2015). Superfast broadband and rural community resilience: Examining the rural need for speed. *Scottish Geographical Journal*. Advance online publication. doi: 10.1080/14702541.2014.978808

This paper examines the relationship between rural dwellers and Internet technology and aims to understand how that relationship is altered with a significant increase in broadband speed. It presents an argument for using 'resilience' as a framework for such technological impact research, positing its potential usefulness for identifying alternative development narratives. Using interview data from 36 individuals in a study conducted with two rural community-based superfast broadband organisations in the UK, it identifies whether superfast broadband plays a role in enhancing rural community resilience. Anticipated outcomes are identified including an increased use of high-capacity services, specifically video services, and also the potential for making new patterns and habits of usage through alternative connection possibilities. Superfast access is equated to increased control over everyday actions, and the need for speed is positioned in relation to the reliability that speed provides for users. Finally, the Internet is perceived broadly as an individualised tool, one that can be accessed for personal skill building, empowerment and ultimately individual scale resilience. These findings highlight the complex, and at times contradictory nature of the relationship between superfast broadband, rural users and potential individual and community resilience. This paper concludes by identifying future research directions.

Beilin, R., et al. (2013). Transition landscapes and social networks: Examining on-ground community resilience and its implications for policy settings in multiscale systems. *Ecology and Society* 18(2), 30.

Community based natural resource management groups contribute to landscape scale ecological change through their aggregation of local ecological knowledge. However, the social networks at the heart of such groups remain invisible to decision makers as evidenced in funding cuts and strategic policy documents. Our research is a pilot study of the social networks in two peri-urban landscapes

in Victoria, Australia. We describe the social network analysis undertaken with regard to natural resource management issues. The findings are assessed against the qualities of resilience: diversity, modularity, connectivity, and feedback loops. A social network analysis tool is discussed with participants to assess its usefulness on-ground and with agency staff involved in the project. We concluded that the sociograms are useful to the groups, however, the management of the tool itself is complex and calls for agency personnel to facilitate the process. Overall, the project did make visible the networks that contribute to a multiscale social and ecological resilience in these landscapes, and in this regard, their use is of benefit to policy makers concerned with supporting networks that build social resilience.

Béné, C., et al. (2012). Resilience: New utopia or new tyranny? Reflection about the potentials and limits of the concept of resilience in relation to vulnerability reduction programmes. *IDS Working Papers* 2012(405), 1-61. Resilience is becoming influential in development and vulnerability reduction sectors such as social protection, disaster risk reduction and climate change adaptation. Policy makers, donors and international development agencies are now increasingly referring to the term. In that context, the objective of this paper was to assess in a critical manner the advantages and limits of resilience. While the review highlights some positive elements –in particular the ability of the term to foster integrated approach across sectors– it also shows that resilience has important limitations. In particular it is not a pro-poor concept, and the objective of poverty reduction cannot simply be substituted by resilience building.

Benson, M., & Garmestani, A. (2011). Can we manage for resilience? The integration of resilience thinking into natural resource management in the United States. *Environmental Management* 48(3), 392-399.

The concept of resilience is now frequently invoked by natural resource agencies in the US. This reflects growing trends within ecology, conservation biology, and other disciplines acknowledging that social–ecological systems require management approaches recognizing their complexity. In this paper, we examine the concept of resilience and the manner in which some legal and regulatory frameworks governing federal natural resource agencies have difficulty accommodating it. We then use the U.S. Forest Service’s employment of resilience as an illustration of the challenges ahead.

Berkes, F. & Ross, H. (2012). Community resilience: Toward an integrated approach. *Society & Natural Resources* 26(1), 5-20.

We explore opportunities for an integrated approach in community resilience to inform new research directions and practice, using the productive common ground between two strands of literature on community resilience, one from social–ecological systems and the other from the psychology of development and mental health. The first strand treats resilience as a systems concept, dealing with adaptive relationships and learning in social-ecological systems across nested levels, with attention to feedbacks, nonlinearity, unpredictability, scale, renewal cycles, drivers, system memory, disturbance events, and windows of opportunity. The second strand emphasizes identifying and developing community strengths, and building resilience through agency and self-organisation, with attention to people-place connections, values and beliefs, knowledge and learning, social networks, collaborative governance, economic diversification, infrastructure, leadership, and outlook. An integrative approach seated in the complex adaptive system and ecological understanding can incorporate the identification of explicit social strengths and connections to place, activated by agency and self-organising.

Boschma, R. (2014). Towards an evolutionary perspective on regional resilience. *Regional Studies* 49(5), 733-751.

This paper proposes an evolutionary perspective on regional resilience. It conceptualizes resilience not just as the ability of a region to accommodate shocks, but extends it to the long-term ability of regions to develop new growth paths. A comprehensive view on regional resilience is proposed in which history is key to understand how regions develop new growth paths, and in which industrial, network and institutional dimensions of resilience come together. Resilient regions are capable of overcoming a trade-off between adaptation and adaptability, as embodied in related and unrelated variety, loosely coupled networks and loosely coherent institutional structures.

Bristow, G. (2010). Resilient regions: Re-'place'ing regional competitiveness. *Cambridge Journal of Regions, Economy and Society* 3(1), 153-167.

Resilience is attracting increasing interest in the thinking and policy discourses around regional development. However, regional development policy remains dominated by a narrow discourse of competitiveness that appears to have negative implications for resilience and is subject to increasing and widespread challenge and critique. Using the Cultural Political Economy approach, this paper explores the complex relationships that exist between competitiveness and resilience and argues that de-contextualised, placeless competitiveness strategies lead to problems of resilience that can be at least partly overcome with respect to more contextualised approaches.

Bristow, G. & Healy, A. (2013). Regional resilience: An agency perspective. *Regional Studies* 48(5), 923-935.

This paper argues that in the nascent theorizing and empirical study of regional economic resilience, the role of human agency has been under-explored to date. In seeking to address this gap, the paper focuses on three key questions: why agency is important in resilience; how agents are organized in complex, regional economies and how they might act; and finally, what an agency perspective means for how resilience might be conceptualized and analysed empirically. It is argued that including the human factor in resilience thinking ultimately means that the role of place and context must assume greater significance.

Broch, H. B. (2013). Social resilience - local responses to changes in social and natural environments. *Maritime Studies* 12(1), 1-17.

Based on extensive empirical ethnographic fieldwork in northern Norway, the article examines social or cultural resilience and life quality in an island, fishing-based community. It is argued that resilience and life quality are interconnected when social or cultural resilience is considered. Life quality, not synonymous with life style or living standard, provides motivation (or lack of it) to cope or be resilient in times of social and environmental uncertainty and change. It is argued that community adaptation should be understood as resilient, but not just because contemporary residents are living at the same location as their forefathers. In spite of marked changes in resources utilized through generations, fish and fishing have continuously been, and still are regarded as, crucial to community viability and self-ascribed identity of the residents.

Buikstra, E., et al. (2010). The components of resilience — Perceptions of an Australian rural community. *Journal of Community Psychology* 38(8), 975-991.

Resilience, of individuals, is a well-established concept in the psychology/mental health literatures, but has been little explored in relation to communities. Related theory in the community development and social impact assessment literature provides insight into qualities and assets of communities that enable them to develop effectively or to adapt to major changes. This article reports the components of community and individual resilience identified through a participatory action research study within a rural Australian community. These are social networks and support; positive outlook; learning; early experiences; environment and lifestyle; infrastructure and support services; sense of purpose; diverse and innovative economy; embracing differences; beliefs; and leadership. These components entail interactions between individuals, the community, infrastructure, the environment and the economy in the process of building resilience. The findings extend from previous research by recognizing environmental and economic factors, infrastructure and support services, as enhancing resilience, and expand the limited evidence base for those wishing to promote resilience at the community scale.

Cablee, J. & Oelofse, M. (2012). An indicator framework for assessing agroecosystem resilience. *Ecology & Society* 17, 18

Taking departure in the theory of resilience in social-ecological systems, we present an analysis and discussion of how resilience theory can be applied to agroecosystems. Building on the premise that agroecosystems are too complex for resilience to be measured in any precise manner, we delineate behavior-based indicators of resilience within agroecosystems. Based on a review of relevant literature, we present and discuss an index of 13 such indicators, which, when identified in an agroecosystem, suggest that it is resilient and endowed with the capacity for adaptation and transformation. Absence of these indicators identifies points of intervention for managers and stakeholders to build resilience where there is vulnerability. The indicators encompass various phases in the adaptive cycle and seek to link core aspects of social-ecological systems. We stress the strong societal need for building resilience in agroecosystems and advocate for a broader way of evaluating resilience in agroecosystems.

Christensen, L. & Krogman, N. (2012). Social thresholds and their translation into social-ecological management practices. *Ecology and Society* 17(1), 5.

The objective of this paper is to provide a preliminary discussion of how to improve our conceptualization of social thresholds using (1) a more sociological analysis of social resilience, and (2) results from research carried out in collaboration with the Champagne and Aishihik First Nations of the Yukon Territory, Canada. Our sociological analysis of the concept of resilience begins with a review of the literature followed by placement of the concept in the domain of sociological theory to gain insight into its strengths and limitations. A new notion of social thresholds is proposed and case study research discussed to support the proposition. Our findings suggest that rather than view social thresholds as breakpoints between two regimes, as thresholds are typically conceived in the resilience literature, that they be viewed in terms of collectively recognized points that signify new experiences. Some examples of thresholds identified in our case study include power in decision making, level of healing from historical events, and a preference for small-scale development over large capital intensive projects.

Clark, J., et al. (2010). A typology of 'innovation districts': What it means for regional resilience. *Cambridge Journal of Regions, Economy and Society* 3(1), 121-137.

In this article, we engage the question of regional resilience theoretically and empirically. Our theoretical approach merges discussions of regional development in evolutionary economic geography (primarily UK based) with regional resilience in urban planning (primarily US based) using Markusen's industrial districts as a framework for analysis (1996). We use data on 'triadic' patents (USA, Japan and Europe) to measure regional innovation, both per capita by region and categorized by firm size for regions in the USA. We then use this data to create a 'typology of innovation districts'. Our analysis suggests that policies encouraging small-firm innovation have broad benefits for regional economies.

Cote, M. & Nightingale, A.J. (2012). Resilience thinking meets social theory: Situating social change in socio-ecological systems (SES) research. *Progress in Human Geography* 36(4), 475-489.

The concept of resilience in ecology has been expanded into a framework to analyse human-environment dynamics. The extension of resilience notions to society has important limits, particularly its conceptualization of social change. The paper argues that this stems from the lack of attention to normative and epistemological issues underlying the notion of 'social resilience'. We suggest that critically examining the role of knowledge at the intersections between social and environmental dynamics helps to address normative questions and to capture how power and competing value systems are not external to, but rather integral to the development and functioning of SES.

Cox, R. S. & Hamlen, M. (2015). Community disaster resilience and the Rural Resilience Index. *American Behavioral Scientist* 59(2), 220-237.

This article describes the development and field testing of the Rural Resilience Index (RRI), an applied disaster resilience assessment index for use in rural and remote communities. The index was generated as part of the Rural Disaster Resilience Project. This community-centred action research project was designed to respond to the global emphasis on increasing the capacity of all communities, large and small, to meet the growing challenge of disasters, climate change, and other threats. The goals of the project were to produce resilience assessment and planning tools that could be used by communities to generate locally relevant data on their current resilience and be able to monitor and enhance their resilience over time. This article describes the development and field testing of the RRI, which is designed as a user-friendly, process-based, qualitative resilience assessment tool. The RRI emphasizes the value of citizen engagement in resilience planning and a whole-of-community approach to resilience addressing issues such as the quality and availability of local resources, expertise, skills, and services; governance issues; economic and employment issues; culture; disaster preparedness; and emergency management planning.

Curtis, A., et al. (2014). The great experiment with devolved NRM governance: lessons from community engagement in Australia and New Zealand since the 1980s. *Australasian Journal of Environmental Management* 21(2), 175-199.

Since the 1980s, natural resource management (NRM) in Australia and New Zealand has been an ambitious experiment with community engagement. Underpinned by theory about public participation, adult education and agricultural extension, but also influenced by neoliberalism's calls for 'smaller government', governments embraced engagement as a cost-effective approach to effecting change. Critiques of community engagement are often misguided as they are frequently based on inauthentic or poor engagement practices. Moreover, these critiques have often failed to

grasp the nature of the problems being addressed, acknowledge the contributions of engagement or understand the importance of building adaptive capacity to respond to an increasingly complex and uncertain future. The foundations for this commissioned article emerged at a workshop where we reflected and deliberated on our experience as NRM researchers and practitioners over the past 20 years. We begin by identifying the key theories underpinning community engagement and community-based NRM (CBNRM). We then reflect on the experience with community engagement in NRM over the past 20 years and identify key lessons for practitioners and policy makers. Drawing on these insights, and the developing theory around new governance and resilience thinking, we identify opportunities for community engagement under a range of possible futures.

Cutter, S. L., et al. (2014). The geographies of community disaster resilience. *Global Environmental Change* 29, 65-77.

There is increasing policy and research interest in disaster resilience, yet the extant literature is still mired in definitional debates, epistemological orientations of researchers, and differences in basic approaches to measurement. As a consequence, there is little integration across domains and disciplines on community resilience assessment, its driving forces, and geographic variability. Using US counties as the study unit, this paper creates an empirically-based resilience metric called the Baseline Resilience Indicators for Communities (BRIC) that is both conceptually and theoretically sound, yet, easy enough to compute for use in a policy context. A common set of variables were used to measure the inherent resilience of counties in the United States according to six different domains or capitals as identified in the extant literature – social, economic, housing and infrastructure, institutional, community, and environmental. Data were from public and freely accessible data sources. Counties in the US Midwest and Great Plains states have the most inherent resilience, while counties in the west, along the US-Mexico border, and along the Appalachian ridge in the east contain the least resilience. Further, it was found that inherent resilience is not the opposite of social vulnerability, but a distinctly different construct both conceptually and empirically. While understanding the overall variability in resilience, the BRIC is easily deconstructed to its component parts to provide guidance to policy makers on where investments in intervention strategies may make a difference in the improvement of scores. Such evidence-based research has an opportunity to influence public policy focused on disaster risk.

Cutter, S. L., et al. (2008). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change* 18(4), 598-606.

There is considerable research interest on the meaning and measurement of resilience from a variety of research perspectives including those from the hazards/disasters and global change communities. The identification of standards and metrics for measuring disaster resilience is one of the challenges faced by local, state, and federal agencies, especially in the United States. This paper provides a new framework, the disaster resilience of place (DROP) model, designed to improve comparative assessments of disaster resilience at the local or community level. A candidate set of variables for implementing the model are also presented as a first step towards its implementation.

Darnhofer, I. (2010). Strategies of family farms to strengthen their resilience. *Environmental Policy and Governance* 20(4), 212-222.

Resilience thinking offers a framework to emphasize dynamics and interdependencies across time, space and domains. It is based on understanding social–ecological systems as complex, and future developments as unpredictable, thus emphasizing adaptive approaches to management. In this paper the four clusters of factors that have been identified as building resilience in large-scale

social–ecological systems are applied at the farm level. Suggestions on how these factors could be operationalized at the farm level are derived from workshops held with family farmers in Austria. The results show that farmers understand change as unpredictable and unfolding, have a number of strategies to ensure the flexibility and adaptability of their farm and build extensive networks to diversify information and income sources. However, these strategies, while ensuring adaptability and transformability, compete for scarce resources. The farmers thus face trade-offs between strategies that ensure the adaptive capacity of their farm over the long term and those ensuring profitability over the short term.

Darnhofer, I. (2014). Resilience and why it matters for farm management. *European Review of Agricultural Economics* 41(3), 461-484.

This paper examines the concept of resilience and its increasing use in the face of both economic uncertainty and climate change, and applies it to farm management. Resilience is understood as encompassing buffer, adaptive and transformative capability. I argue that resilience thinking offers alternative insights into farm management and how farmers balance short-term efficiency and long-term transformability, balance exploitation and exploration. Farm resilience can be strengthened or eroded by policy measures and family dynamics. Overall resilience proposes an alternative conceptual lens to one building on equilibrium, thus highlighting complex dynamics and the role of farmer agency in navigating change.

Darnhofer, I., et al. (2010). Assessing a farm's sustainability: Insights from resilience thinking. *International Journal of Agricultural Sustainability* 8(3): 186-198.

Research on sustainability in agriculture often focuses on reducing the environmental impacts of production systems. However, environmentally friendly production methods may not be sufficient to ensure the long-term economic and social sustainability of a farm. Taking a systems approach to sustainable farming, we turn to resilience thinking with its focus on the interdependence of social and ecological systems. We apply this approach to farming by conceptualizing a farm as being part of a set of systems spanning several spatial scales and including agro-ecological, economic and political-social domains. These subsystems interact and are subjected to their own complex dynamics. Within such a complex adaptive system, farm sustainability can only be achieved through adaptability and change. To be ready for the inevitable periods of turbulent change, a farmer needs to retain diversity and redundancy to ensure adaptability. Resilience is thus more likely to emerge when farmers hone the capacity to transform the farm, when farm production is attuned to the local ecological carrying capacity, and when learning and innovation are targeted outcomes. This article shows how resilience theory applied to farming may provide a more comprehensive route to achieving sustainability and offers rules of thumb as guides to building farm resilience.

Dinh, H. & Pearson, L. (2015). Specifying community economic resilience – a framework for measurement. 59th AARES Annual Conference. Rotorua, New Zealand.

This paper argues for a specific and measurable definition and a comprehensive and actionable measurement framework for community economic resilience (CER). The paper focuses on how to specify CER; what attributes form CER; and how to measure CER based on its definition and attributes. The paper argues that CER can be specified through four guiding questions ('Resilience of what?'; 'Resilience to what?'; 'Resilience for whom?'; 'Resilience for what?') and is formed by attributes including community capitals, diversity and accessibility. A comprehensive measurement framework is proposed that quantifies both potential and emerging CER through attributes and multiple outcomes, respectively.

Domptail, S., et al. (2013). Managing socio-ecological systems to achieve sustainability: A study of resilience and robustness. *Environmental Policy and Governance* 23(1), 30-45.

Growing symptoms of the mismanagement of socio-ecological systems (SESs) show that the long-term existence of these systems is threatened. SES management improvement is the aim of many policy measures. But how successful are these various simultaneous policy measures in achieving the sustainable management of SESs? A framework for analysing policy measures and the management actions of land users was developed by Leach et al. (2010): the authors postulate that the sustainability of an SES depends on four system properties – stability, resilience, durability and robustness – and that external shocks and stresses affect these properties differently. The aim of this contribution is to identify the strengths and weaknesses of the approach by applying it to three case studies, in Namibia, Argentina and Indonesia. We found that (1) more actions were directed towards resilience and robustness than towards command and control, (2) actions directed at stability and durability were generally undertaken at the national level and (3) the introduction of the concept of robustness to illustrate the property of adaptability enables the identification of trade-offs among properties, but (4) issues of ecological degradation were difficult to address explicitly. We consider that the framework can make a useful contribution to policy making by framing the impact of a given intervention on SESs on the four key system properties. Yet, the framework provides a structure to make ex-post assessment of SES management or to formulate assumptions about potential synergies/trade-offs among impacts on system properties. However, we suggest using it as complementary to other policy impact assessment methods. Copyright © 2013 John Wiley & Sons, Ltd and ERP Environment.

Downes, B. J., et al. (2013). How do we know about resilience? An analysis of empirical research on resilience, and implications for interdisciplinary praxis. *Environmental research letters* 8(014041).

We sought to understand how knowledge about resilience is produced. We examined empirical research into resilience from the social and natural sciences, randomly selected a sample of these studies and analysed their methods using common criteria to enable comparison. We found that studies of resilience from social scientists largely focus on the response of individuals to human-induced change events, while those from natural scientists largely focus on the response of ecological communities and populations to both environmental and human-induced change events. Most studies were of change over short time periods and focused on small spatial scales. Social science studies were dominated by one-off surveys, whereas natural science studies used a diversity of study designs to draw inferences about cause-and-effect. Whilst these differences typically reflect epistemological and methodological traditions, they also imply quite different understandings of resilience. We suggest that there are significant methodological barriers to producing empirical evidence about interactions between complex social and ecological systems.

Dwiartama, A. (2014). *Investigating resilience of agriculture and food systems: Insights from two theories and two case studies* (Unpublished doctoral dissertation). University of Otago, Dunedin, NZ.

There has been a growing concern described in the literature for the sustainability and resilience of agriculture and food (agrifood) sector towards local and global shocks. Resilience, defined in this context, is the ability of a system or society to recover from crisis while maintaining its function and identity. This thesis identifies two contrasting perspectives influencing contemporary resilience thinking and debated in the literature: one emphasises resilience as a system's emergent property,

and the other emphasises the agency of the system's components to actively shape the system to be resilient.

In response to those perspectives and drawing their significance to the agrifood sector, this thesis seeks to clarify and understand what 'resilience' means for agrifood systems in the context of local and global changes. It does so by offering a novel theoretical framework in which resilience thinking is in dialogue with two social theoretical approaches that are commonly recognised (albeit usually as contradictory perspectives) in agrifood studies: food regime theory and actor-network theory (ANT). This framework facilitates the assessment of resilience in different agrifood systems by bridging the conflicting perspectives within resilience thinking by means of a theoretical pluralism. The application of this theoretical framework illustrates how resilience is influenced by both a global structure that rises and declines in response to social, economic and environmental drivers, as well as local actors (both humans and material objects) that, through their relational effects, perform agency to enhance the adaptive capacity of the society.

The theoretical framework is examined empirically through case studies of two agrifood systems: Indonesia's rice agriculture and the New Zealand kiwifruit industry. Data was collected from official documents, published reports and semi-structured interviews with 61 participants as representatives of various stakeholders of the two agrifood systems.

The findings of this thesis illustrate that both agrifood systems have demonstrated resilience towards various shocks, but in different ways in response to differing variables. Food regime analysis suggests both that resilience of the two agrifood systems is influenced by the expansions and contractions of the global food regimes over the course of their development and, to some extent, that each agrifood system shaped the trajectories of the food regimes in which they reside. However, food regime theory fails to address the idiosyncrasies that occur and the agency of local actors in shaping the resilience of the systems. Analysis through ANT enables a closer look at how networks of human and non-human actors adapt to the shocks at a particular time and in a particular space. Findings indicate that the multiplicity of rice creates a diversity of meanings and actions by which resilience is enacted in the broad context of Indonesia, while kiwifruit facilitates a process of transformative resilience within the industry in New Zealand as a means to adapt to changing circumstances and shocks.

This thesis finds that, firstly, resilience is a dynamic, multi-dimensional, context-dependent process; secondly, different contemporary theoretical models focus on different aspects while overlooking others; and thirdly, therefore, resilience cannot be accurately gauged through generic models and measures. It concludes that resilience needs to be assessed using multiple tools that take account of and accommodate the uniqueness of each agriculture and food system.

Dwiartama, A. & Rosin, C. (2014). Exploring agency beyond humans: The compatibility of Actor-Network Theory (ANT) and resilience thinking. *Ecology and Society* 19(3), 28.

At first glance, the compatibility of social theory and resilience thinking is not entirely evident, in part because the ontology of the former is rooted in social interactions among human beings rather than ecological process. Despite this difference, resilience thinking engages with particular aspects of social organisation that have generated intense debates within social science, namely the role of humans as integral elements of social-ecological systems and the processes through which given social structures (including material relations) are either maintained or transformed. Among social theoretical approaches, Actor-Network Theory (ANT) is noted for its distinctive approach to these aspects. ANT proposes that human and nonhuman components (both referred to as actants) have

the same capacity to influence the development of social-ecological systems (represented as actor-networks) by enacting relations and enrolling other actors. We explore the notion of agency that is employed in resilience thinking and ANT in order to extend our understandings of human-environment relationships through complementary insights from each approach. The discussion is illustrated by reference to ongoing assessment of resilience as it is experienced and expressed in two distinctive agricultural production systems: Indonesian rice and New Zealand kiwifruit. We conclude by establishing the potential for ANT to provide more profound theoretical conceptualizations of agency, both human and nonhuman, in analyses of social ecological systems.

Forney, J. & Stock, P.V. (c2013). Conversion of Family Farms and Resilience in Southland, New Zealand. *International Journal of Sociology of Agriculture and Food* 21(1), 7-29.

The well-known deregulation of New Zealand agriculture prompted the growth of dairy farming, particularly in the region of Southland. The formation of the giant cooperative Fonterra only exacerbated the conversion of sheep farms into dairy farms that challenged both farmers' and the region's traditional identity as a sheep country. Interviews with converted farmers show that farming families convert to dairy primarily in an attempt to preserve what is important for them: farm succession and a professional identity. At the community level, conversions to dairy prompted economic revival and a reversal of population loss. This article engages the literature on resilience and rural communities to explore Southland's adaptation to new economic and farming realities while exploring potential shocks in the future around financialisation and environmental well-being.

Freshwater, D. (2015). Vulnerability and resilience: Two dimensions of rurality. *Sociologia Ruralis*. Advance online publication. doi: 10.1111/soru.12090

The idea of resilience seems to be replacing sustainability as a defining concept for rural development. And, like sustainability, resilience is a vague concept that has many definitions and implications. It captures the idea that rural regions are exposed to shocks that require a mix of efforts both to mitigate their impact and incidence, and to adapt to a new environment after a shock event. In this respect resilience has much in common with the concept of risk management, which is pervasive in economics. In the article concepts from risk management are linked to four categories of risk to demonstrate that the type of risk can suggest specific ways to think about resilience strategies. Because rural regions are inherently exposed to high levels of risk, and have significant constraints on their ability to mitigate it, developing a way to achieve greater resilience is both crucial and difficult. This suggests that many rural regions may remain vulnerable, despite efforts to mitigate risk and buffer its impacts.

Glover, J. (2012). Rural resilience through continued learning and innovation. *Local Economy* 27(4): 355-372.

The article investigates how rural businesses demonstrate resilience when faced with adversities and the processes they utilise to survive. The work explores rural resilience through the use of learning and innovation in small rural enterprises. Drawing on case study work from rural England the results indicate that individual businesses find ways to overcome adversities and, through learning how to cope with them, create a resilient culture. Individuals businesses use various resources, and in some cases innovate, in order to continue business operations during difficult times. Continual learning becomes an important aspect of incremental innovations which are required merely for the business to survive. The work is timely as many small enterprises face difficulties in the wake of instability in the economic world.

Harrald, J. (2012). The case for resilience: A comparative analysis. *International Journal of Critical Infrastructures* 8(1), 3-21.

The utility of the concept of resiliency as a paradigm for managing society's ability to resist, absorb, and recover from extreme events is dependent upon the ability to evaluate a community's resilience and to assess the potential impacts of intentional and unintentional interventions. A framework for developing and using resilience metrics is presented. The critical components of resilience for three diverse Atlantic coastal communities subject to potential catastrophic coastal flooding are developed, described, and compared using this framework. The analysis demonstrates that, although the three areas face a common threat, they should adopt different resilience enhancing strategies that are determined by local structural, economic, and social conditions.

Hassink, R. (2010). Regional resilience: A promising concept to explain differences in regional economic adaptability? *Cambridge Journal of Regions, Economy and Society* 3(1), 45-58.

One of the most intriguing questions in economic geography is why some regional economies manage to renew themselves, whereas others remain locked in decline. To tackle this question, the idea of resilience has emerged building upon concepts derived from ecology, psychology, disaster studies and elsewhere. This conceptual paper aims at critically assessing whether regional resilience contributes to our understanding of regional economic adaptability, in particular, and its potential contribution to evolutionary economic geography, in general. It concludes that, due to three main shortcomings, its contribution is relatively limited.

Hendrickson, M. K. (2014). Resilience in a concentrated and consolidated food system. Columbia, MO, Department of Rural Sociology, University of Missouri.

The current economic and social organisation of our food system presents social, ecological and economic risks that threaten the long term capability of humanity to provide its food needs. To examine food system resilience it is necessary to see that ecological risks are bound up with the social and economic organisation of society; that relationships between people and between people and their particular places are critical; and that issues of scale are keenly important. The current consolidated and globalised food system has resulted from horizontal and vertical integration in food system sectors and globalisation of agricultural and food markets. This system constrains farmers (and others) in making choices that can fend off likely ecological and social disruptions while limiting their ability to accommodate change. It has eliminated smaller farms and businesses that provided a redundancy of role and function resulting in few failsafe mechanisms for the food system. A focus on efficiency, standardization and specialization has decreased the diversity of scale, form and organisation across the food system. Finally, the dominant food system's inability to solve food insecurity and hunger within both rich and poor countries, coupled with an industrial diet that uses up a great many natural resources, makes the system precarious. While these risks are significant, by looking at social and ecological notions of resilience, new forms of agrifood system resilience that is connected to people and place can be proposed.

Henry, A. M. & Johnson, T.R. (2015). Understanding Social Resilience in the Maine Lobster Industry. *Marine and Coastal Fisheries* 7(1), 33-43.

The Maine lobster *Homarus americanus* fishery is considered one of the most successful fisheries in the world due in part to its unique co-management system, the conservation ethic of the harvesters, and the ability of the industry to respond to crises and solve collective-action problems. However, recent threats raise the question whether the industry will be able to respond to future threats as successfully as it has to ones in the past or whether it is now less resilient and can no longer

adequately respond to threats. Through ethnographic research and oral histories with fishermen, we examined the current level of social resilience in the lobster fishery. We concentrated on recent threats to the industry and the ways in which it has responded to them, focusing on three situations: a price drop beginning in 2008, a recovery in 2010/2011, and a second collapse of prices in 2012. In addition, we considered other environmental and regulatory concerns identified by fishermen. We found that the industry is not responding effectively to recent threats and identified factors that might explain the level of social resilience in the fishery.

Hogan, A., et al. (2013). Focusing resource allocation - Wellbeing as a tool for prioritizing interventions for communities at risk. *International journal of environmental research and public health* 10(8), 3435-3452.

This study examined whether a wellbeing approach to resilience and adaptation would provide practical insights for prioritizing support to communities experiencing environmental and socio-economic stressors. Methods: A cross-sectional survey, based on a purposive sample of 2,196 stakeholders (landholders, hobby farmers, town resident and change agents) from three irrigation-dependent communities in Australia's Murray-Darling Basin. Respondents' adaptive capacity and wellbeing (individual and collective adaptive capacity, subjective wellbeing, social support, community connectivity, community leadership, in the context of known life stressors) were examined using chi-square, comparison of mean scores, hierarchical regression and factor-cluster analysis. Results: Statistically significant correlations ($p < 0.05$) were observed between individual (0.331) and collective (0.318) adaptive capacity and wellbeing. Taking into account respondents' self-assessed health and socio-economic circumstances, perceptions of individual (15%) and collective adaptive capacity (10%) as well as community connectivity (13%) were associated with wellbeing ($R^2 = 0.36$; $F(9, 2099) = 132.9$; $p < 0.001$). Cluster analysis found that 11% of respondents were particularly vulnerable, reporting below average scores on all indicators, with 56% of these reporting below threshold scores on subjective wellbeing. Conclusions: Addressing the capacity of individuals to work with others and to adapt to change, serve as important strategies in maintaining wellbeing in communities under stress. The human impacts of exogenous stressors appear to manifest themselves in poorer health outcomes; addressing primary stressors may in turn aid wellbeing. Longitudinal studies are indicated to verify these findings. Wellbeing may serve as a useful and parsimonious proxy measure for resilience and adaptive capacity.

Houston, J. B. (2015). Bouncing forward: Assessing advances in community resilience assessment, intervention, and theory to guide future work. *American Behavioral Scientist* 59(2), 175-180.

Initial interest in community resilience by the U.S. federal government has been followed by waves of community resilience theory building and of community resilience assessment and intervention development and testing. This special issue of *American Behavioral Scientist* includes reviews of recent work to conceptualize, measure, and foster community resilience. These reviews identify common community resilience principles and considerations that cut across individual community resilience projects. These insights can inform next steps in community resilience practice and research.

Hudson, R. (2010). Resilient regions in an uncertain world: Wishful thinking or a practical reality? *Cambridge Journal of Regions, Economy and Society* 3(1), 11-25.

What might a resilient region look like in the face of an uncertainty about the global economy and environment? To begin to answer this question, the article first reviews existing concepts of resilience and critically reviews dominant neoliberal concepts of regional development. This forms

the basis for seeking to specify the characteristics of resilient regions, arguing that these must have a lighter environmental footprint and involve a greater degree of regional closure in and regionalisation of economic activities. The final concluding section evaluates the limits to regional resilience in the face of global change.

Hunt, W., et al. (2012). Thwarting plague and pestilence in the Australian sugar industry: Crop protection capacity and resilience built by agricultural extension. *Crop Protection* 37, 71-80.

This paper investigates how Australian sugar industry extension services over the last decade have overcome historical pest management challenges in sugarcane (*Saccharum* spp.). The industry has done this by building increased capacity amongst its extension agents and farmers. This paper considers how coordinated extension efforts have reduced production losses from its two principal pests: greyback canegrub – *Dermolepida albohirtum* (Waterhouse), and rodents (i.e., *Rattus sordidus* and *Melomys burtoni*). It details the complexity of the respective pest management issues and the efficacy of industry efforts in resolving outbreak situations in the early 2000s. The paper then investigates how combined research, development and extension efforts have been able to mitigate risk of similar outbreaks over the last decade. These RD&E efforts have delivered IPM packages that are practical, defined, and ready for on-farm use. They have delivered sustained reductions in pest damage and an increase in knowledge and skills amongst extension agents and growers. Overall, industry is more confident, skilled and pro-active in the management of rats and canegrubs than in decades past. Consequently, the Australian sugar industry is a more resilient entity as a function of these extension initiatives. The strategies described here provide a model for building capacity and resilience in the sugar and other industries when confronted with multi-faceted challenges related to pest biology and behaviour, availability of inputs for production, economic forces and environmental considerations.

Hunt, W., et al. (2011). Agricultural extension: Building capacity and resilience in rural industries and communities. *Rural Society* 20(2), 112-127.

This paper contributes to an improved understanding of contemporary agricultural extension. Specifically, it considers how extension can add to capacity and resilience of Australian rural industries and their associated communities. It provides perspectives and examples on how extension, capacity-building and resilience are conceptually linked and includes an extension program in the the Tasmanian sheep industry as a supporting case study. Commenced in 2003 the 8?5 Wool Profit Program, now SheepConnect-Tasmania, was funded by Australian Wool Innovation, and the findings of an independent external review, together with supporting documentation from agencies closely linked to the extension program are presented. This study confirms rural extension services can function in capacity-building roles in communities that far exceed simply achieving changes in on-farm agricultural production or natural resource management practices. Extension agents are investments that add value and capacity to the communities that rely on them, providing vital accessible skills to stakeholders negotiating challenging circumstances. Retention of core agricultural extension capacity and expertise at regional levels should therefore be a strategic objective for rural community stakeholders, and industry and government policy makers.

Johnson, T. R., et al. (2014). Qualitative indicators of social resilience in small-scale fishing communities: An emphasis on perceptions and practice. *Human ecology review*, 20.

This paper reports on ethnographic research aimed at understanding what resilience means to those living within fishery-dependent communities. We draw on semi-structured and oral history interviews, focus groups, and household and business interviews in four Maine fishing communities

to examine the reflections of fishermen and other community members on the past, present, and future of their communities, including the threats they face and how they are able to respond to them. Based on our analysis, we identify broad qualitative indicators of resilience: survival, social identity, diversification, getting by, and optimism. The indicators of resilience that we identify are difficult to fully understand using secondary data and, therefore, we argue that understanding them also requires an ethnographic research approach that focuses on the practices of fishermen and the context in which those fishermen live.

Kenney, C. and S. Phibbs (2014). Shakes, rattles and roll outs: The untold story of Māori engagement with community recovery, social resilience and urban sustainability in Christchurch, New Zealand. *Procedia Economics and Finance* 18, 754-762.

On September 4, 2010 a 7.1 magnitude earthquake struck the Canterbury region of New Zealand, heralding a sequence of earthquakes, which included a fatal 6.2 earthquake centred under Christchurch City on February 22, 2011. In response, local Māori recovery initiatives were collaborative, effective and shaped by cultural values, including the principle 'āroha nui ki te tangata' (extend love to all). Disaster sector stakeholders are increasingly recognising the value of community-led initiatives that facilitate social resilience. In contrast, cultural approaches to facilitating community resilience receive minimal acknowledgement. The Māori response to the Christchurch earthquakes and subsequent recovery process constitutes an exemplar of best practice. The Joint Centre for Disaster Research in partnership with the Christchurch Iwi (tribe) Ngāi Tahu, conducted research to identify, and document the ways Māori cultural factors facilitated community resilience in response to the earthquakes. A Māori qualitative research methodology has shaped the community-based participatory research design. Māori research participants views were ascertained through semi-structured and focus group interviews. Dialogical and narrative interviewing approaches were used to foster community engagement, as well as capture Māori understandings and practices associated with disaster management, recovery and resilience. Data analysis drew on social theories, risk perspectives and indigenous epistemological concepts. Analysis of the results suggest that New Zealand's disaster response policies may be enhanced by the integration of Māori approaches to facilitating disaster risk mitigation, community recovery and social resilience. This paper documents the different levels of support that were extended to whānau (families), communities and responding agencies. The cultural principles that underpin the extension of support are examined in relation to Bruno Latour's theories about how technologies shape action and Putnam's ideas on social capital. The impact of cultural support strategies on social resilience is addressed and the relevance to national and local authority disaster recovery strategies outlined.

Keogh, D., et al. (2011). Resilience, vulnerability and adaptive capacity of an inland rural town prone to flooding: A climate change adaptation case study of Charleville, Queensland, Australia. *Natural Hazards* 59(2), 699-723.

Australia is currently experiencing climate change effects in the form of higher temperatures and more frequent extreme events, such as floods. Floods are its costliest form of natural disaster accounting for losses estimated at over \$300 million per annum. This article presents an historical case study of climate adaptation of an Australian town that is subject to frequent flooding. Charleville is a small, inland rural town in Queensland situated on an extensive flood plain, with no significant elevated areas available for relocation. The study aimed to gain an understanding of the vulnerability, resilience and adaptive capacity of this community by studying the 2008 flood event. Structured questionnaires were administered in personal interviews in February 2010 to householders and businesses affected by the 2008 flood, and to institutional personnel servicing the region (n = 91). Data were analysed using appropriate quantitative and qualitative techniques.

Charleville was found to be staunchly resilient, with high levels of organisation and cooperation, and well-developed and functioning social and institutional networks. The community is committed to remaining in the town despite the prospect of continued future flooding. Its main vulnerabilities included low levels of insurance cover (32% residents, 43% businesses had cover) and limited monitoring data to warn of impending flooding. Detailed flood modelling and additional river height gauging stations are needed to enable more targeted evacuations. Further mitigation works (e.g., investigate desilting Bradley's Gully and carry out an engineering assessment) and more affordable insurance products are needed. Regular information on how residents can prepare for floods and the roles different organisations play are suggested. A key finding was that residents believe they have a personal responsibility for preparation and personal mitigation activities, and these activities contribute substantially to Charleville's ability to respond to and cope with flood events. More research into the psychological impacts of floods is recommended. Charleville is a valuable representation of climate change adaptation and how communities facing natural disasters should organise and operate.

Kimhi, S. (2014). Levels of resilience: Associations among individual, community, and national resilience. *Journal of Health Psychology*. Online Advance Publication. doi: 10.1177/1359105314524009

This article focuses on limited knowledge regarding the associations among three levels of resilience and the importance of these associations: individual, community, and national. The few studies that have examined these associations indicated the following: (a) There are significant positive low correlations among individual, community, and national resilience. (b) Some demographic variables significantly predict all three of them. (c) There is limited knowledge whether and to what degree there are mutual influences among these levels of resilience. (d) All three levels of resilience predict individual well-being and successful coping with potential traumatic events.

Krishnaswamy, A., et al. (2012). Increasing the resilience of British Columbia's rural communities to natural disturbances and climate change. *BC Journal of Ecosystems and Management* 13(1), 1-15.

It is predicted that climate change has increased the frequency and intensity of natural disturbances and weather related natural disasters. Rural forest-based communities are especially vulnerable to changes in natural disturbance regimes influenced by climate change because their economic, social, and cultural aspects of life are closely linked to the local environment and climate.

In this article, we discuss the impacts of wildfires on communities as an example of how natural disturbances impact humans. The impacts to humans of wildfire is indicative of the type of effects that other natural disturbances such as widespread insect infestation, landslides, floods, drought, storms, avalanches, permafrost melt, forest diseases, erosion, and gradual ecosystem change can have on communities. First Nations communities may be significantly and uniquely impacted by natural disturbances and climate change due to their remote location, strong connection, and heavy reliance on the environment for subsistence and in preserving their culture and their unique and often vulnerable economic situation. We describe the uncertainty of predicting the frequency and intensity of natural disturbances in a particular location. We suggest that the most effective management response to address this uncertainty is to focus on reducing vulnerability and increasing community resilience. Finally, we list some of the management strategies and tools that communities and those that work with them have been using in British Columbia and elsewhere to increase community resilience to natural disturbances and climate change.

Kulig, J. C., et al. (2008). Understanding community resilience in rural communities through multimethod research. *Journal of Rural and Community Development* 3(3), 76-94.

Community resiliency is a theoretical framework and social process that attempts to explain how communities address adversity. Generating information about this concept has largely been accomplished through qualitative research methods and the development of the Resiliency Scale, which was based upon previous qualitative research on the topic. A multimethod study was used to explore community resiliency in two rural communities and one urban neighbourhood. In this article we specifically examine: "What are the merits of employing different research methods to explore community resiliency and health status?" Qualitative interviews, a household survey, and analysis of provincial health databases were all used. The understanding of community resiliency as identified from each of these three methods as well as a discussion of the advantages and disadvantages of each method is presented.

Lorenz, D. (2013). The diversity of resilience: Contributions from a social science perspective. *Natural Hazards* 67(1), 7-24.

The paper presents contributions to the widespread resilience paradigm from a social science perspective. Certain aspects of social systems, especially their symbolic dimension of meaning, need to be taken into account in the endeavour to research coupled social–ecological systems. Due to the symbolic dimension, disasters are defined as the failure of future expectations, and social resilience is defined as the social system property of avoiding or withstanding disasters. In relation to this, three capacities of social systems (adaptive, coping, and participative) that constitute resilience are presented. The adaptive capacity is the property of a system in which structures are modified to prevent future disasters, whereas the coping capacity is the system's property of coping with calamitous processes that occurred in the past. The participative capacity is a measure of the system's ability to change its own structures with regard to interventions by other systems, decreasing the system's resilience. The concept of resilience provides important epistemological and political insights and can help overcome an orientation tied together with the concept of vulnerability that blocks social capacities for the mitigation of disasters.

Lyon, C. (2014). Place systems and social resilience: A framework for understanding place in social adaptation, resilience, and transformation. *Society & Natural Resources* 27(10), 1009-1023.

This article proposes a three-part framework for accounting for the physical and social components of place as a system in community adaptation to crisis. While ideas of place have been incorporated into research on social and community resilience and adaptation, the existing work tends to focus on sense of place or place attachment. Generally, it does not account for the roles of place character or infrastructure. This article develops a novel three-part framework—incarnate, discarnate, and chimerical place—to provide a richer description of how place acts a system to inform social adaptation to crises, and specifically how it informs community resilience or transformation. This framework is demonstrated through case studies of two forest-dependent communities in British Columbia, Canada, adapting to local mill closures.

Lyon, C. & Parkins, J.R. (2013). Toward a social theory of resilience: Social systems, cultural systems, and collective action in transitioning forest-based communities. *Rural Sociology* 78(4), 528-549.

Impacts from post-Fordist and post-staples economic transition in the Canadian natural resource sector have resulted in dramatic challenges to the livelihoods of many rural residents and the viability of many rural communities. This study seeks to understand community response to

economic transition through a lens of social ecological resilience. This article puts forward Archer's theory of cultural morphogenesis as an analogous model of social ecological change that focuses attention on cultural systems, cultural elaboration, and collective action within an adaptive cycle of resilience. With case material from focused ethnographies of two forest-dependent communities, we identify distinctive interactions between culture and agency over time that condition community response to change, and we make an analytical distinction between the social system and cultural system. These insights point to catalysts for collective action and adaptation within a resilient cultural realm that extend beyond institutional factors such as economic dependency or political opportunity. By integrating culture, we also deepen the social theory contribution to social-ecological resilience.

MacKinnon, D. & Derickson, K.D. (2013). From resilience to resourcefulness: A critique of resilience policy and activism. *Progress in Human Geography* 37(2), 253-270.

This paper provides a theoretical and political critique of how the concept of resilience has been applied to places. It is based upon three main points. First, the ecological concept of resilience is conservative when applied to social relations. Second, resilience is externally defined by state agencies and expert knowledge. Third, a concern with the resilience of places is misplaced in terms of spatial scale, since the processes which shape resilience operate primarily at the scale of capitalist social relations. In place of resilience, we offer the concept of resourcefulness as an alternative approach for community groups to foster.

Maclean, K., et al. (2013). Six attributes of social resilience. *Journal of Environmental Planning and Management* 57(1), 144-156.

The concept of resilience has attracted much attention in recent times. However, there remains a distinct knowledge gap with respect to the social aspects of resilience. This paper describes six attributes of social resilience identified through case study research. Research was undertaken by a multi-disciplinary team of researchers who worked in partnership with representatives from five key government and non-government agencies from the Wet Tropics region in North Queensland, Australia. Research findings move understanding of social resilience, which is an emerging area of interest within natural resource management, from a set of assumptions to an evidence base.

Madsen, W. & O'Mullan, C. (2014). 'Knowing me, knowing you': Exploring the effects of a rural leadership programme on community resilience. *Rural Society* 23(2), 115-160.

Rural leadership programmes have proliferated in the past 15 years in countries, including Australia. Whilst most programmes have focussed on transactional leadership which aims to develop individual leaders, increased attention is being paid to transformational approaches to leadership which aim to enhance social networks, cohesiveness and civic activity within communities. In this way, leadership can enhance community resilience. This article uses interpretive case study methodology to evaluate a rural leadership programme in Central Queensland, Australia. Two key themes, self-development and building social capital, illustrate how leadership programmes can contribute to the development of community resilience. The article provides greater insight into the importance of leadership as a community responsibility rather than leadership as a narrow set of skills and highlights the need for such approaches to be transformative in the way they contribute to both individual and community wellbeing.

Magis, K. (2010). Community resilience: An indicator of social sustainability. *Society & Natural Resources* 23(5), 401-416.

Change is a constant force, in nature and in society. Research suggests that resilience pertains to the ability of a system to sustain itself through change via adaptation and occasional transformation. This article is based on the premises that communities can develop resilience by actively building and engaging the capacity to thrive in an environment characterized by change, and that community resilience is an important indicator of social sustainability. Community resilience, as defined herein, is the existence, development, and engagement of community resources by community members to thrive in an environment characterized by change, uncertainty, unpredictability, and surprise. The U.S. Roundtable on Sustainable Forests commissioned a research project to develop a theoretically and empirically based definition of community resilience as well as an associated measurement instrument. In this article, the research is presented, the emergent definition and dimensions of community resilience are posited, and the Community Resilience Self Assessment is introduced.

Manring, S. L. (2014). The role of universities in developing interdisciplinary action research collaborations to understand and manage resilient social-ecological systems. *Journal of Cleaner Production* 64, 125-135.

Sustainable development activities are comprised of complex sets of social, economic, and ecological factors. Cross-scale knowledge and applications are increasingly valuable today in achieving successful interdisciplinary action research collaborations among universities and other stakeholders in order to understand and manage the predictable and unpredictable transformative change possibilities in social-ecological systems. This paper analyses case studies of two complex regional social-ecological systems that illustrate the dynamic interactions between human societies and natural systems. The framework of panarchy, which integrates the cross-scales and domains of social, economic, and environmental systems, is incorporated as a means of examining the dimensions of adaptability and resilience, and the evolution of these social-ecological systems as stakeholder learning networks. The practical intent of using case studies is threefold: 1. To demonstrate how a holistic synthesis of these multi-domain frameworks can enrich descriptive and prescriptive analyses of social-ecological systems phenomena, 2. To make these integrative frameworks and analytical tools more readily useful for students, university educators, researchers and academic-practitioners, to incorporate into interdisciplinary curricula, teaching, research and practice, and 3. To offer these cross-domain tools to facilitate integrative action research collaborative partnerships among educators, researchers, academic-practitioners, and other social-ecological system stakeholders.

Marchant, J. (2012). Is rural resilience enhanced through social inclusion? Presentations from the International Rural Network Forum 2012, Rural and Remote Resilience: Making the Priorities Possible. Whyalla, South Australia, Unpublished, 1-18.

This paper explores the implications of a state-based social inclusion approach for the wellbeing and resilience of rural communities. Here it is argued that the notion of social inclusion as applied to rural networks must be appreciated against a background of social characteristics in Australian rural communities, encompassing existing regional social challenges and opportunities. Exploring rural social characteristics helps reveal the strong social basis of rural resilience.

Initially, this presentation explores the social foundations underlying rural resilience. This exploration extends to encompass social revitalisation as a means of facilitating prosperity in rural communities. Understanding rural resilience in this manner allows a reflection on the practicality of

sustaining rural areas by invoking the discourse of social inclusion. A summary of social inclusion policies are presented in order to understand the social promise suggested by the government approach to social exclusion. A rich social inclusion knowledge illustrates possibilities for reaching current social objectives to relieve inequity.

Rural inhabitants periodically find themselves exposed to localised social inclusion strategies that are inspired by the national Social Inclusion Principles and the South Australian Social Inclusion Initiative. The relatively recent foray into social inclusion research reveals some uncertainty regarding the real social benefits of proposed initiatives. For instance, state-based social inclusion approaches emphasise participation in local literacy endeavours. Some researchers are uncertain whether such participation initiatives are of assistance to rural inhabitants or benefit the intentions of a viable community. Arguably, rural people as recipients of government initiatives are ideally equipped to inform upon the impact of the social inclusion agenda.

This presentation concludes by considering some of the strategies most likely to lead to social improvement, and the terms required to supply a successful array of diverse social strategies supportive of rural futures.

Markantoni, M., et al. (2014). Motives for starting up a side activity in rural areas in the Netherlands. *Local Economy* 29(6-7), 723-739.

This paper explores the side activities of non-farmers in rural areas in the Netherlands and more specifically their start up motives. A side activity is a small-scale home-based activity, which provides a supplementary income to the household. Side activities may have the potential to diversify the economic base of rural areas and to contribute to the quality of life and the social well-being in rural communities. Yet, little is known about their role for the development of rural areas. Furthermore, to date, rural policies have largely neglected non-farmers' side activities in their rural development strategies partly because of their small size and partly because of the lack of available data in business registers. This study, by exploring the side activity motives, brings to light the specific needs and aspirations of the owners and is based on the results of 260 interviews by side-activity owners. The results highlight that the owners are mainly oriented towards non-economic benefits corresponding to the individuals' needs, dreams and desires, while financial betterment falls into a secondary place. People are in search of a different type of pay-off than economic rewards, namely the opportunity for a better quality lifestyle. This is relevant for policy makers because of the potential contribution of side activities to providing services, diversifying rural activities and adding to the resilience of rural communities.

Martin, R. & Sunley, P. (2015). On the notion of regional economic resilience: Conceptualization and explanation. *Journal of Economic Geography* 15(1), 1-42.

Over the past few years a new buzzword has entered academic, political and public discourse: the notion of resilience, a term invoked to describe how an entity or system responds to shocks and disturbances. Although the concept has been used for some time in ecology and psychology, it is now invoked in diverse contexts, both as a perceived (and typically positive) attribute of an object, entity or system and, more normatively, as a desired feature that should somehow be promoted or fostered. As part of this development, the notion of resilience is rapidly becoming part of the conceptual and analytical lexicon of regional and local economic studies: there is increasing interest in the resilience of regional, local and urban economies. Further, resilience is rapidly emerging as an idea 'whose time has come' in policy debates: a new imperative of 'constructing' or 'building' regional and urban economic resilience is gaining currency. However, this rush to use the idea of

regional and local economic resilience in policy circles has arguably run somewhat ahead of our understanding of the concept. There is still considerable ambiguity about what, precisely, is meant by the notion of regional economic resilience, about how it should be conceptualized and measured, what its determinants are, and how it links to patterns of long-run regional growth. The aim of this article is to address these and related questions on the meaning and explanation of regional economic resilience and thereby to outline the directions of a research agenda.

McCrea, R., et al. (2014). A conceptual framework for investigating community wellbeing and resilience. *Rural Society* 23(3), 270-282.

This article presents the conceptual basis for empirically testing the relationship between community wellbeing and resilience. Previous research has argued that rural communities facing rapid economic, social and environmental change need to be resilient to maintain or enhance their community wellbeing. However, it is often not clear what is meant by community wellbeing or resilience, and how they differ. Both concepts are often imprecise and seldom clearly distinguished from each other when placed in a theoretical context. Further, wellbeing and resilience are often assumed to be positively associated but this may not necessarily be the case (Amundsen, 2012; Armitage, Béné, Charles, Johnson, & Allison, 2012; Coulthard, 2012). The present analysis suggests that community resilience is best conceptualised as a type of functioning or process whereby community resources are mobilised in strategic ways by community agents in adaptive responses to change (e.g., Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008) and community wellbeing is best conceptualised as a state, which is hopefully enhanced as a result of community resilience. Rather than a direct correlation, the relationship might be iterative whereby poor wellbeing triggers a mobilising of resilience which in turn leads to future wellbeing. The article outlines the main dimensions of community wellbeing and resilience that require valid and reliable measurement to test the relationship. The implication of such a relationship is that communities might need to focus on resilience rather than current wellbeing to achieve future wellbeing.

McManus, P., et al. (2012). Rural community and rural resilience: What is important to farmers in keeping their country towns alive? *Journal of Rural Studies* 28(1), 20-29.

Many studies have highlighted the phenomenon of rural decline in parts of the developed world, summarised as a loss in agricultural employment leading to a decline in the number and size of rural settlements. This study of small towns in part of Australia's inland rural "heartland" employs the concepts of interactional rural community of place and rural resilience to identify how farmers perceive their interactions with their local town. This study suggests that robust levels of ongoing engagement between farmers and town communities are important in maintaining rural populations and services along with both a strong local economy and environment. Face-to-face interviews with 115 farmers in two rural regions of New South Wales, Australia, highlight the importance of the local economy and jobs, the quality of the local environment and a strong sense of belonging, in contributing to a strong sense of local community and potential for resilience.

Mitchell, C. J. A. (2013). Creative destruction or creative enhancement? Understanding the transformation of rural spaces. *Journal of Rural Studies* 32, 375-387.

For more than fifty years, rural scholars have demonstrated the increasing fluidity and dynamism of rural spaces. In select locales, quotidian activity has given way to hedonic ventures as stakeholders have introduced innovative functions to attract the pleasure-seeking consumer. I have described this scenario as a type of 'creative destruction'. This process, however, does not apply to all rural communities undergoing functional change. To address this issue, I present an alternative

neologism, 'creative enhancement,' to account for the varied evolutionary trajectories that non-metropolitan spaces are taking. I re-examine three Canadian villages (Elora, St. Jacobs and Ferryland) to illustrate how these twin processes unfold in amenity-rich locales. My findings enrich our understanding of how rural landscapes change as they transition from a productivist-based to potentially multi-functional state.

Mitchell, C. J. A. and S. B. de Waal (2009). Revisiting the model of creative destruction: St. Jacobs, Ontario, a decade later. *Journal of Rural Studies* 25(1), 156-167.

Ten years ago, the model of creative destruction was developed to predict the fate of communities that base their development on the commodification of rural heritage (Mitchell, C.J.A., 1998. Entrepreneurialism, commodification and creative destruction: a model of post-modern community development. *Journal of Rural Studies* 14, 273–286). Its application to the village of St. Jacobs, Canada, demonstrated that entrepreneurial investment had fostered the creation of a setting for aestheticized consumption. In this paper we demonstrate that creative destruction has continued to unfold in the village over the course of the past decade. The evolutionary path taken is assessed in light of current literature on rural space. It is concluded that to fully understand the transformative process, one must integrate the demands of myriad sub-cultures, whose social relations, ideologies and actions will contribute to the development of a contested landscape of consumption. This finding necessitates that modifications be made to the model and its various stages. The most significant is recognition that the "heritage-scape" is an interim state of landscape change; one that displaces the productivist landscape of the industrial period, and precedes the creation of the "neo-productivist" leisure-scape of post-industrialism. Whether or not such a "final" state is achieved is dictated by the power struggle that inevitably arises amongst sub-cultures engaged in the transformation of rural space.

Mitchell, M., et al. (2014). Applying resilience thinking to natural resource management through a "planning-by-doing" framework. *Society & Natural Resources* 27(3), 299-314.

Natural resource management (NRM) organisations are increasingly looking to resilience thinking to provide insights into how social and environmental systems interact and to identify points of intervention. Drawing on complex systems analysis, resilience thinking emphasizes that landscapes constantly change from social and ecological interactions, and focuses NRM planners' attention on identifying key variables, feedbacks, and thresholds that can help improve intervention strategies. More deliberative approaches are being developed to use resilience thinking in ways that engage and build human capacity for action. This article documents experiences shared with NRM agencies in rural Australia as we developed new approaches to link resilience thinking with collective learning principles. We present an emerging framework through which heuristics associated with resilience thinking is being used as part of a planning-by-doing process. The framework is being tested to assess whether and how it can enable change agents to advance their capacities for adaptation and transformation.

Mowbray, C. T., et al. (2007). Neighborhood research from a spatially oriented strengths perspective. *Journal of Community Psychology* 35(5), 667-680.

Research investigating neighbourhood effects on children and families has been largely deficit and individual-focused, investigated structural variables, and has typically produced equivocal findings and small effect sizes. We suggest an approach focused on community strengths and resources that stresses the role of measures of social interaction variables and the utilisation of analytic strategies that model the spatial and nested nature of contextual effects. To that end, we offer a community

resilience model that includes both community-level risk and protective factors, and suggests sources to obtain community-level strengths data. We also provide a guide for locating community resource data appropriate for use in neighbourhood effects research utilizing geographical information systems, multilevel modelling, and spatial analytic strategies. Finally, we discuss the challenges and issues to be addressed in further developing a strategy for investigating neighbourhood effects from a strengths perspective.

Munoz, S.-A., et al. (2014). Involving rural older people in service co-production: Is there an untapped pool of potential participants? *Journal of Rural Studies* 34, 212-222.

Co-production is currently promoted by governments as a response to public service reform in conditions of austerity and, within a neoliberal ideology, to compel individual and collective responsibility. While co-production is intuitively attractive in its appeal to community collectivism and provision of locally appropriate services, there is a lack of reflection on the actual capacity of rural communities to become co-producers. This study considers co-production as a form of participation requiring attributes of volunteering and social involvement. It applies a model of formal participation with 5 levels from attendance at community events to organising new services, in order to assess the potential for service co-production by rural older people in 6 Scottish settlements. We find that rural older people are already heavily participating in community activities but with lower numbers taking part in the activities that require higher levels of commitment. It is the most well 'resourced' in terms of personal characteristics such as education that are most likely to participate. There are few older people who are willing to help their community that are not already involved in formal participation. Overall, findings suggest there is a very small potential pool of non-involved rural older residents who are willing to participate at high levels of commitment (co-production). Further research is now needed to build on these findings, and particularly to explore what it is that will encourage those already involved at some level to step up to co-production.

Munoz, S.-A., et al. (2014). Processes of community-led social enterprise development: Learning from the rural context. *Community Development Journal*.

This article considers whether, and if so how, rural communities can be supported, through a facilitated process, to create social enterprises within the field of health and care. Using results from the thematic analysis of four community case studies involved in a facilitated action-research process, the article identifies community capabilities and entrepreneurial skills needed to create such rural community-based service providers. The identification of similarities and differences in how the development process took place in four communities allows us to present a development model of our facilitated process. The article contributes to understanding about rural community social enterprises for service provision and the processes associated with their creation.

Norris, F. H., et al. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology* 41(1-2), 127-150.

Communities have the potential to function effectively and adapt successfully in the aftermath of disasters. Drawing upon literatures in several disciplines, we present a theory of resilience that encompasses contemporary understandings of stress, adaptation, wellness, and resource dynamics. Community resilience is a process linking a network of adaptive capacities (resources with dynamic attributes) to adaptation after a disturbance or adversity. Community adaptation is manifest in population wellness, defined as high and non-disparate levels of mental and behavioural health, functioning, and quality of life. Community resilience emerges from four primary sets of adaptive capacities—Economic Development, Social Capital, Information and Communication, and

Community Competence—that together provide a strategy for disaster readiness. To build collective resilience, communities must reduce risk and resource inequities, engage local people in mitigation, create organisational linkages, boost and protect social supports, and plan for not having a plan, which requires flexibility, decision-making skills, and trusted sources of information that function in the face of unknowns.

Oncescu, J. (2014). The impact of a rural school's closure on community resiliency. *Leisure/Loisir* 38(1), 35-52.

In this study, a community resiliency model is utilized to explore the impacts of a rural school–community relationship and the school's subsequent closure on community resiliency in the village of Limerick, Saskatchewan. The findings from semi-structured interviews and focus groups indicate that community recreation events and activities, prior to and after a rural school's closure, have considerable implications for community resilience. In particular, the school–community relationship cultivated community recreation events and activities that displayed residents' resilience potential. In addition, as a result of the school's closure, the community's residents were able to mobilise community assets to develop new community recreation events and activities to recover from the loss of the school. As a result, the residents displayed a number of attributes found in resilient communities. In fact, this study highlights that Limerick's school helped the community cope and adapt to the school's closure. This article demonstrates the strengths of rural school–community relationships, the changes that a school's closure can have on rural community members' lives, and also specific actions that community members can take to develop and sustain the community's resiliency.

Paniagua, A. (2013). Farmers in remote rural areas: The worth of permanence in the place. *Land Use Policy* 35, 1-7.

The drivers of change in rural economies and societies in the global north and their different presentations at the place level are commonly recurring topics in recent rural studies. In this context, it is possible to discuss the concept of rural resilience associated with the combination of processes of restructuring and resistance. Restructuring implies different processes of change, and resistance suggests permanence. Change and permanence have different forms of presentation: place-spatial, community and individual. In this context, the present study examines the strategies of farmers in selected remote rural areas of Spain; with the purpose of exploring the different processes of adaptation at an individual level, founded on economic and non-economic (moral) decisions. The methodology is mainly qualitative: biographical interviews with farmers living in remote rural areas.

Parsonson-Ensor, C. and C. Saunders (2011). Resilience of farming systems during periods of hardship. *ARGOS research report*. Christchurch, ARGOS.

The ability of farm businesses to be sustainable has become increasingly difficult with pressures rising from the need to expand or change land use in order to remain viable; social values, beliefs and trends; and environmental change with the consequent regulation. To remain resilient to these stresses and changes farmers must develop effective management responses and strategies. This paper investigates these management techniques identifying some solutions considered and adopted by New Zealand sheep and beef farmers. Using two, farm level surveys conducted by Fairweather in 1986 and ARGOS in 2010, some aspects of resilient farming systems are identified. Due to the different time periods of these two surveys and the different global markets and systems effecting localised farming systems there were notable differences in management responses and

strategies. The results show that despite apparent hardship farmers currently seemed more willing to take risks, with many more borrowing to invest in on farm developments with the goal of accessing new areas of production and markets. This was seen with many farmers adapting to utilise the current strength of diary returns to supplement the reduced returns being received for sheep and beef products. This willingness to borrow was very different to the mentality shown by farmers in 1987 with then very few farmers borrowing, with refinancing existing debt being the main reason for taking loans. Other areas in which farmers were currently appearing to be taking risks were through innovation, trying new techniques, new management methods, developing niche products, diversification and looking to access new markets. The main similarity between time periods was the greatest response to economic changes being the adoption of a low input policy. This result was quite significant, as farmers using conventional management systems, which comprised the majority of the 1986 survey, are generally believed to resort to other strategies or responses. The ARGOS sample on the other hand is biased towards farmers on low input strategies. Of the farms surveyed there were two main management strategies adopted in times of hardship or economic stress. One was sticking with familiar, proven methods that have been developed over time. The other was one that constantly evolves, remaining flexible and adaptive through employing new practices and incorporating products into their business when necessary or seen as optimal. Which of these was most resilient was as dependent on the farmer as it was the management strategy they implemented. It was felt that in the present climate the majority of existing farms had a reasonable degree of resilience as they had survived in the current irregular global environment.

Peerlings, J., et al. (2014). Self-reported resilience of European farms with and without the CAP. *Journal of Agricultural Economics* 65(3), 722-738.

Firms are able to survive only if they adapt appropriately in response to disturbances. The ability of a farm to continue after a disturbance is defined as resilience. To analyse the resilience of EU farms we explore exit and the number of adaptation strategies that farmers follow under two scenarios. The current CAP will be continued in the base scenario, while it will be abolished in scenario 2. The outcomes show that under both scenarios large, more specialised farms with young farm heads are most resilient, and small more diversified farms headed by old farmers are least resilient.

Pendall, R., et al. (2010). Resilience and regions: Building understanding of the metaphor. *Cambridge Journal of Regions, Economy and Society* 3(1), 71-84.

We survey literatures from disciplines including ecology, psychology, disaster studies, geography, political science and economics to understand how they see resilience. Some literature describes resilience as a return to conditions before a shock. Other resilience writing embraces a complex systems perspective. For other fields, resilience describes the ability of people, regions or ecosystems to thrive despite adversity. We conclude that although the resilience metaphor poses the danger of fuzziness and necessitates careful specification of space and time boundaries in studying resilience phenomena, it proves useful for illuminating regional change and linking different types of regional stresses to alternative resilience frameworks.

Pfefferbaum, B., et al. (2015). Community resilience interventions: Participatory, assessment-based, action-oriented processes. *American Behavioral Scientist* 59(2), 238-253.

This article compares six interventions to enhance community resilience. In this review, underlying principles for community resilience interventions are (a) use a multihazard approach relevant to the local context, (b) utilize community assessment, (c) focus on community engagement, (d) adhere to bioethical principles, (e) emphasise both assets and needs, and (f) encourage skill development. The

interventions are compared with respect to parameters that address their foundation, methodology, and implementation.

Pike, A., et al. (2010). Resilience, adaptation and adaptability. *Cambridge Journal of Regions, Economy and Society* 3(1), 59-70.

The resilience of places in response to uncertain, volatile and rapid change has emerged as a focus of academic and policy attention. This paper aims to contribute to understanding and explaining the resilience of places. Drawing upon evolutionary economic geography, the concepts of adaptation and adaptability are developed in a framework based upon agents, mechanisms and sites. In contrast to equilibrium-based approaches, this approach can better capture the geographical diversity, variety and unevenness of resilience and address questions of what kind of resilience and for whom.

Plodinec, M. J., et al. (2014). Applications of a “whole community” framework for enhancing community or campus resilience. *Procedia Economics and Finance* 18, 9-16.

The Community and Regional Resilience Institute (CARRI) has developed a unique approach to community resilience based on a “Whole Community” concept. It treats communities as a collection of systems, each with its own resilience. CARRI has applied its approach to two kinds of communities: civil communities, and institutions of higher education (IHEs). For both civil communities and IHEs, CARRI carried out a pilot program. For each participant, their leadership directed an assessment of the resilience of the component systems to the types of changes most relevant to that community. Each assessment provided suggestions for filling any gaps identified as part of the assessment. The pilot for the seven IHEs followed that for the seven civil communities and was able to take advantage of lessons learned from the first. These two pilot programs led to the following conclusions:

- CARRI's systems-based approach is both understandable and usable by both types of communities. In practice, it seemed to provide a natural way to look at a community.
- In general, IHEs were able to make better use of the approach than civil communities. This is due, in part, to the improvements made in the IHE pilot program based on the civil communities' results. However, it also reflects the more hierarchical nature of IHEs, the tighter coupling of systems within an IHE and greater discretion in the use of resources in an IHE.
- College campuses can be crucial catalysts for enhancing the resilience of civil communities.
- Leadership is a key, perhaps the key, element in the success of a community resilience initiative.

Reid, R. & Botterill, L.C. (2013). The multiple meanings of ‘resilience’: An overview of the literature. *Australian Journal of Public Administration* 72(1), 31-40.

‘Resilience is in danger of becoming a vacuous buzzword from overuse and ambiguity’ (Rose 2007: 384). ‘Resilience’ is widely used in public policy debate in Australia in contexts as diverse as drought policy, mental fitness in the Australian Defence Force, and in discussion around the Australian economy's performance during the global financial crisis. The following paper provides an overview of the use of the term ‘resilience’ in the academic literature in both the natural and social sciences. The key conclusion from this research is that the term is highly ambiguous, it is used for different purposes in different contexts and in some cases the understandings of the term are diametrically opposed. The malleability of the term suggests that it might be politically risky if employed in policy debate unless clearly defined in each instance.

Roberts, E. & Townsend, L. (2015). The Contribution of the Creative Economy to the Resilience of Rural Communities: Exploring Cultural and Digital Capital. *Sociologia Ruralis*. Online advance publication. doi: 10.1111/soru.12075

This article develops understanding of cultural and digital capital in order to evaluate the contribution of creative practitioners to rural community resilience. Online practices today impact on creative work in rural locales in a number of ways. However, exactly how they extend 'reach' and contribute to rural creativity deserves greater attention. We examine how broadband Internet access and online practices impact on rural creative work and, in turn, how this enables creatives to participate at different levels in their rural communities, thus contributing to research into both rural community resilience and rural creative economies by providing in-depth qualitative analysis. Through interviews undertaken in rural Scotland, the article outlines the implications of poor rural Internet connectivity for creative economies and explores the impact of this on the role of creatives in their rural communities and their 'community-focused' creative activities. Our findings suggest creative practitioners are using digital technologies and adaptive approaches to overcome barriers to connectivity and to remain in rural locations. Creatives are invested in their communities and their rurality on a number of levels, contributing to community resilience through building cultural capital in diverse ways, and to 'ripple effects' from online activities.

Rosin, C., et al. (2012). Resilience in retrospective: analysis of response to shocks and stress in the New Zealand kiwifruit and sheep and beef sectors. *ARGOS research report* Christchurch, N.Z., Agriculture Research Group on Sustainability.

Sustainability forms a key concept within the Agriculture Research Group on Sustainability (ARGOS) project. Since the project was initiated in 2004, however, sustainability has been exposed to increasing scrutiny as an operational concept in the assessment and promotion of improved social and environmental outcomes in agriculture production. This report, thus, involves the further elaboration of two alternative approaches to sustainable practice: resilience theory, a concept given initial application in the work of the ARGOS environmental objective (Maegli et al 2007); and the capitals approach to assessing sustainable practice, which has been addressed by the economic objective (Saunders et al 2010). Here the focus is on the narratives of change told by the farmers and orchardists participating in the project. For the purposes of this report, resilience theory is used to provide means to frame processes of change. In particular, the analysis examines the capacity of the farmers and orchardists to develop successful strategies in response shocks and stress relating to economic, environmental or social events. The expectation is that such events have the potential to disrupt existing patterns and relationships (or the system) of production leading either to the consolidation of management practice along similar lines or the complete reorganisation of the system with subsequent impacts on the economic, environmental and social outcomes. In addition, the relationship between the capitals approach to sustainability and resilience perspectives provides a vehicle for examining the role that the economic, environmental and social context plays in enabling or constraining the capacity to respond to shock.

Ross, H. & Berkes, F. (2014). Research approaches for understanding, enhancing, and monitoring community resilience. *Society & Natural Resources* 27(8), 787-804.

The growing interest in the understanding of community resilience suggests a need for improving research approaches. This article reviews methods used to date, and suggests opportunities for expanding the range and efficacy of approaches used to understand, improve, and monitor the coupled social and ecological aspects of community resilience. We explore three potential foci: research approaches that enhance understanding of community resilience; those that help to

improve community resilience through the research process; and the further development of methods to guide monitoring. Most studies have relied on mixed and multistaged methods, including in-depth interviews and case studies. We comment on the wide range of approaches used, and suggest others that could be valuable. There is particular scope for greater use of cumulative studies, historical or retrospective studies, participatory methods, and systems approaches, and a need for more methods that explore the coupling of social and ecological dimensions.

Rutherford, T. D. & Holmes, J. (2014). Manufacturing resiliency: Economic restructuring and automotive manufacturing in the Great Lakes region. *Cambridge journal of regions, economy and society* 7(3), 359-378.

Through a case study of the Great Lakes region automotive industry spanning the USA–Canada international border, this article critically reassesses the concept of regional resiliency and the sustainability of the recent resurgence of American manufacturing. We argue that regional resiliency needs to be reframed around regional integration into global production networks and the restructuring of workplace governance especially with regard to the significant ‘recalibration’ of labour relations reflected in declining rates of unionisation, lowered labour costs and more ‘flexible’ employment relations. The region is no longer as dominant in North American automotive manufacturing as it once was and must respond to increasing competition from emergent auto-making regions in the southern USA and Mexico.

Schippers, P., et al. (2015). Landscape diversity enhances the resilience of populations, ecosystems and local economy in rural areas. *Landscape Ecology* 30(2), 193-202.

Context: In today’s world, rapid environmental and economic developments and changes pose major threats to ecosystems and economic systems.

Objective: In this context we explore if resilience can be increased by the spatial configuration of the rural landscape in an integrated ecological-genetic-economic way.

Methods: We study the concept of landscape diversity from genetic, ecological and economic perspectives. Results: We show that small-scale landscapes are potentially more resilient than large-scale landscapes, provided that ecosystem patch sizes are sufficiently large to support genetic diversity and ecosystem and economic functions. The basic premise underlying this finding is that more variation in a landscape generally leads to greater genetic and species diversity. This, in turn, stabilizes populations and strengthens the different ecosystem elements in the landscape. Greater variation in ecosystem elements provides for more varied ecosystem services, which may enhance the resilience of the local economy.

Conclusion: We conclude that a resilient landscape is shaped within the context of economic and ecological possibilities and constraints, and is determined by landscape diversity and spatial organisation.

Schneider, A. H., et al. (2015). Using technology to enhance rural resilience in pre-hospital emergencies. *Scottish Geographical Journal*. Online advance publication. doi: 10.1080/14702541.2014.978810

This paper contributes to understanding of the geography of emergency pre-hospital care in rural Scotland and explores the role technology can play in improving the resilience of rural communities. In rural areas worldwide, it can be difficult to access appropriate health services locally and long journeys present challenges to the delivery of care. Poor mobile network coverage, remote locations with poor transport networks and inclement weather can all delay the arrival of help. The Scottish

Ambulance Service operates a Community First Responder (CFR) scheme to care for patients in mainly rural areas while an ambulance is on its way. Community First Responders are volunteers trained in the basics of life-support but may have to care for patients with life-threatening illness (and sometimes injury) for a considerable period of time. Our paper showcases the Managing Information in Medical Emergencies project, which aims to support CFRs. We have developed novel technology to enable CFRs to capture a greater volume of patient data (including physiological parameters), provide them with an enhanced awareness of a patient's medical status and automatically generate handover reports for them. It is hoped that the handover reports improve the chain of communication from first person on scene to definitive care.

Schouten, M., et al. (2013). Resilience-based governance in rural landscapes: Experiments with agri-environment schemes using a spatially explicit agent-based model. *Land Use Policy* 30(1), 934-943.

In this paper we apply an agent-based modelling approach to improve our understanding of how government payments to enhance public values in social-ecological systems can contribute to the resilience of the system. As a system we take a rural area with high quality nature including farmers managing this area. These farmers make the decision either to produce milk for the world market or bring their land under the agri-environment scheme, which is supposed to enhance biodiversity at landscape level. We explore how farmers respond to introducing a flexible compensatory payment related to the degree to which AES parcels contribute to the spatial coherence of the local network of nature areas. We use this characteristic of the location of AES parcels as a proxy for higher species diversity. We also explore how farmers respond to increased volatility in output prices, which we consider as an example of a large scale disturbance with a potentially major implication on the spatial conditions of the network of nature areas. We find that if payments are spatially conditioned, farmers bring fewer parcels under the AES, but with a higher contribution to the spatial conditions for species diversity. We also find that if the payments are spatially restricted, the AES parcels are less sensitive to fluctuations in output prices. Assuming that it takes several years for a parcel with conventional farming to increase biodiversity, we conclude that if the government introduces a spatial condition into the AES payment system, the social-ecological system that we have considered would increase in resilience, because the condition for biodiversity would become less sensitive to large scale disturbances due to increased price fluctuation on the world market.

Schouten, M. A. H., et al. (2012). A resilience-based policy evaluation framework: Application to European rural development policies. *Ecological Economics* 81, 165-175.

Given the major changes that rural areas have undergone, and are continuing to undergo, serious problems of achieving sustainable development are being experienced. These changes have multiple characters, varying from changes in ecosystem conditions to changes in socio-economic impacts, due to, for example, food- and financial crises. Nowadays, there is an increasing awareness of the need to develop rural policies that support adaptive strategies of stakeholders in response to a disturbance. We propose that resilience thinking offers a framework that could be helpful in the governance of rural changes. This framework is based on the complexity of the social-ecological system and takes into account the unpredictable future, as it emphasizes adaptive approaches to management. As such, it helps evaluate to what extent rural development policies contribute to the resilience of rural areas. Nine criteria were developed including thirteen specifications. In order to evaluate the usability and usefulness of the proposed framework, a case study has been performed that specifically investigated the degree of resilience of a European rural development policy (i.e. the spending of extra funds generated through compulsory modulation under the 2009 Health Check in the Netherlands).

Schuster, E. & Colby, B. (2013). Farm and Ecological Resilience to Water Supply Variability. *Journal of Contemporary Water Research & Education* 151(1), 70-83.

Water supplies are constrained in the lower Colorado River Basin in the western United States and northern Mexico by extensive agricultural use, increasing urban populations, ecosystem needs, and the pressures of climate change. Agriculture is the largest consumptive use of water, and better understanding of how farmers are managing water supply risk and adapting to unreliable water supplies can help lead to the creation of appropriate solutions for the region. Based upon original primary data collected in 2012 in the Mexicali Valley of northern Mexico, we present findings on farm households that give us a better understanding of agricultural water management and adaptation options. We build upon these results to present voluntary, market-based solutions to improve the region's ability to adapt to water supply variability. Increasing use of water markets and improving the cooperation among stakeholders are promising solutions with the potential to benefit agricultural and ecological water interests alike.

Scott, M. (2013). Resilience: A conceptual lens for rural studies? *Geography Compass* 7(9), 597-610.

This paper examines the concept of resilience and its increasing application within rural studies in the face of both economic uncertainty and ecological crisis. Two approaches to resilience are firstly explored: an equilibrium (or bounce-back) approach, based on 'return to normal' assumptions, and an evolutionary (or bounce-forward) approach characterised by an emphasis on adaptive capacity and transformation. While resilience overlaps with the existing literature within rural studies and rural development, the paper argues that resilience thinking opens up new perspectives and provides the potential to 're-frame' rural studies debates, provides a bridging concept. Two key contributions of resilience are identified: Firstly, resilience offers alternative analytical methods and insights for rural studies, particularly when drawing on evolutionary economic geography ideas of path dependencies and path creation, a relational perspective of rural space, and identification of place attributes which may enhance or undermine resilience. Secondly, resilience provides an alternative policy narrative for rural development practice. This includes an emphasis on adaptive networked governance, embedding ecological concerns into rural development practices and a call for blending the local and global in rural development processes. The paper concludes by identifying future research directions for rural resilience.

Severi, C., et al. (2012). The resilience approach contribution to rural communities social assessment for social sustainability based strategies implementation. *International journal of food system dynamics* 3(1), 61-73.

Evaluating the rural communities capacity to manage changes is of paramount importance for effective Social Sustainability strategies identification. The aim of the present study is to analyze if social resilience can be integrated into the social assessment of rural communities, with the aim of implementing sustainability-oriented policies and strategies. A literature review was carried out on the Resilience approach definition and its application to the Social Assessment in rural areas. The analysis showed that the Resilience approach enriches the Social Assessment by focusing on the specific capabilities of the communities in managing changes. The Resilience perspective embraces the dynamic character of communities and human-ecosystem interactions providing a deeper understanding of how a community's positive response to change can be strengthened and supported. Moreover, the specific focus on rural communities highlights how strongly social and ecological resilience are intertwined in guaranteeing social sustainability which, in turn, is strictly interrelated with environmental and economic sustainability.

Simmie, J. and R. Martin (2010). The economic resilience of regions: Towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society* 3(1), 27-43.

In this paper, we review the different definitions of resilience and their potential application in explaining the long-term development of urban and regional economies. We reject equilibrium versions of resilience and argue instead that we should seek an understanding of the concept from an evolutionary perspective. After discussing a number of such perspectives, we focus on the adaptive cycle model from panarchy theory to generate testable hypotheses concerning urban and regional resilience. Two case study city-regional economies are used to explore this model. We conclude that the evolutionary adaptive cycle model, though not without problems, warrants further study as a framework for analysing regional economic resilience.

Sinclair, K., et al. (2014). Can resilience thinking provide useful insights for those examining efforts to transform contemporary agriculture? *Agriculture and Human Values* 31(3), 371-384.

Agricultural industries in developed countries may need to consider transformative change if they are to respond effectively to contemporary challenges, including a changing climate. In this paper we apply a resilience lens to analyse a deliberate attempt by Australian governments to restructure the dairy industry, and then utilize this analysis to assess the usefulness of resilience thinking for contemporary agricultural transformations. Our analysis draws on findings from a case study of market deregulation in the subtropical dairy industry. Semi-structured interviews were conducted with dairy producers, their service providers, and industry and government staff. We found the adaptive cycle concept contributed to understanding how deregulation changed industry structures and working practices, how those changes led to feedbacks within the production system and supply chain, and how the industry following deregulation has experienced periods of stability and instability. Regime shifts were associated with an increase in demand for human capital, a degradation of cognitive social capital and a reduction in farm income. Findings identified that were not readily explained by the resilience thinking conceptual framework include a producer's ability to anticipate and make choices and the change in social and power relationships in the industry.

Skerratt, S. (2013). Enhancing the analysis of rural community resilience: Evidence from community land ownership. *Journal of Rural Studies* 31, 36-46.

Resilience, and specifically the resilience of (rural) communities, is an increasingly-ubiquitous concept, particularly in the contexts of resistance to shocks, climate change, and environmental disasters. The dominant discourse concerning (community) resilience centres around bounce-back from external shocks. In this paper, I argue that it is necessary to query this dominant, singular conceptualisation for two main reasons. Firstly, through reviewing the international literature, it is possible to construct a spectrum of (community) resilience research concepts from 'reactive bounce-back' through to 'proactive human agency', where the latter increasingly questions the reactive stance of much community resilience analysis. Secondly, the new findings I present from 17 community land trusts (CLTs) in Scotland demonstrate processes of proactive change being implemented by communities-of-place, rather than simply as reactions to external shocks or events. Communities' aimed-for outcomes are far wider than shock-absorption, and include deliberately building their skills and capacity-base in a context of constant change, rather than in anticipation of singular events. As a result of bringing together empirical findings with a wider review of the resilience literature, I conclude that to persist with only the dominant narrative of a reactive, shock-related definition of (community) resilience unnecessarily constrains our analysis, since it bypasses evident proactive processes and wider adaptability outcomes. I further conclude that we need to continue to problematise resilience as a concept, in order to be more accurate with its usage. This is

important in itself, and, I argue, a necessary precursor to enhancing dialogue between resilience and other concepts such as social capital.

Smith, J. W., et al. (2012). Community Resilience in Southern Appalachia: A Theoretical Framework and Three Case Studies. *Human Ecology* 40(3), 341-353.

A fundamental assumption in nearly all research on social adaptation to environmental change is that there is a concomitant and inverse relationship between human communities' dependence upon particular natural resources affected by environmental change and those communities or societies' resilience to disturbances. However, recent theoretical and empirical developments suggest resilience is a dynamic social process determined, in part, by the ability of communities to act collectively and solve common problems. The interactional approach to community is utilized to develop a framework whereby various patterns of social interaction define the process of social resilience. Data come from multiple mixed methods case studies of forest dependent communities within Southern Appalachia. The findings reveal varied processes of social resilience can occur in communities with similar levels of resource dependence; a community's composition of internal social ties and their cross-scale linkages to external agencies and organisations define these processes.

Smith, K. and Lawrence, G. (2014). Flooding and food security: A case study of community resilience in Rockhampton. *Rural Society* 23(3), 216-228.

In early 2011 the regional city of Rockhampton was cut off from its main sources of food supply by unprecedented flooding across the State of Queensland. Despite the existence of local and state government disaster management plans, the Rockhampton community was highly vulnerable to food insecurity during this time. We argue that this vulnerability was due both to its reliance on long food supply chains that were disrupted due to loss of transport access and infrastructure, as well as to the relative lack of local, alternative, food distribution channels. However, the experience of Rockhampton also illustrates numerous examples of community resilience. In this article, we consider the ways that different actors within the community (including government, private sector, industry and community groups) mobilised resources, information and relationships in order to ensure food security for the city during the flooding crisis of 2011. This draws upon an understanding of community resilience as the capacity to thrive and transform in an environment of change. Based on policy analysis and qualitative interviews with key actors in Rockhampton, we found that despite many examples of positive 'collective community capacity' in the immediate period of crisis, such as flexible and innovative use of personal networking to move food from one location to another, numerous challenges arose in relation to formal decision making and information-sharing processes. Finally, we question the extent to which the 2011 events might be influencing community-led changes to the structure of the regional food system so that it may become more resilient to climate change-induced crises into the future. This highlights key aspects of resilience that contribute to well-being and food security at the community level both in the short- and long-term.

Steiner, A. and Atterton, J. (2014). The contribution of rural businesses to community resilience. *Local Economy* 29(3), 228-244.

This paper explores the role of private sector enterprises in building the resilience of rural Scotland. In addition, the paper seeks to identify changes in rural enterprise activities and their impact on rural life. The paper is based on quantitative secondary data analysis and two qualitative case studies. These demonstrate how rural enterprises contribute to economic and social development in rural communities and the wider resilience of rural locations. Analysis of the secondary data highlights an

increasing contribution by private sector enterprises to overall employment in rural Scotland. The data verify the importance of SMEs and, in particular, micro businesses in rural job creation. They also show the role of rural businesses in increasing the diversification of the local economy and therefore in building wider rural community resilience. The results identify changing employment patterns in rural areas (such as an increasing level of self-employment, part-time and home working and multiple job holding) which might be associated with the capacity to adapt to dynamic changes in the socio-economic environment. Finally, qualitative findings help to further understand how private sector enterprises contribute to the social and environmental resilience of rural Scotland by identifying the role they play in enhancing the quality of life of those living in rural locations. Consequently, the paper makes a substantial and original contribution to existing knowledge and debate on resilience. It uses current data on the characteristics of rural private sector enterprises to identify their economic, social and environmental importance in building the resilience of rural places and their communities.

Steiner, A. and Cleary, J. (2014). What are the Features of Resilient Businesses? Exploring the Perception of Rural Entrepreneurs. *The Journal of Rural and Community Development* 9(3), 1-20.

The economic importance of the private sector, such as its contribution to GDP or employment creation, is well recognised in research and policy. More recently, positive social and environmental contributions of businesses have been explored and there is a growing body of evidence recognising the potential role of private sector enterprises in contributing to enhanced community resilience. However, the extent to which business owners and their businesses are resilient themselves is not well investigated. In the context of globalisation and rapid change, businesses are exposed to external shocks and economic social and environmental changes. Private sector enterprises, which are so important in the overall community development, are therefore forced to adapt to the changing dynamics of their soundings.

Based on an exploratory study of businesses in South Australia, which aimed to enhance our understanding of the role of private sector enterprises in local development, this paper explores how business owners cope with a changing business environment. We question therefore what are the features of resilient businesses? Through in-depth face-to-face interviews with rural business owners, we identify approaches of selected entrepreneurs that enabled them to adapt to changes creating resilient businesses. Findings of this paper present implications for practitioners, researchers and policymakers.

Steiner, A. and Markantoni, M. (2014). Unpacking community resilience through Capacity for Change. *Community Development Journal* 49(3), 407-425.

Enhancing inclusion and self-reliance at community level is gaining ground in policy terms, due – in part – to the need to increase the efficiency of public spend, associated with the global financial crisis. Within Scotland, this shift is manifested through multiple policy and community interventions seeking to enhance resilience of communities. Measuring community resilience remains challenging as there is a lack of practical tools and assessment methods to capture aspects of ‘change’. The research presented here is based on the ‘Capacity for Change’ programme, which, through community engagement and empowerment, seeks to enhance the capacity of rural places and develop inclusive communities. The paper presents (i) an evaluation model for measuring community resilience and (ii) empirical findings that derive from deploying the model in a real-life scenario. Based on 155 face-to-face interviews with inhabitants from rural communities, resilience is revealed as being multi-scalar and interdependent, indicating the importance of ‘unpacking’ resilience by exploring different levels of its social and economic components. The findings indicate

the significance of inter-connectivity of local and regional, and those less and more resilient areas. In addition, it shows that locations with more diversified services and resources are reported by their residents as being more resilient.

Tonts, M., et al. (2014). Path dependence, resilience and the evolution of new rural economies: Perspectives from rural Western Australia. *Journal of Rural Studies* 36, 362-375.

This paper draws on the emerging field of evolutionary economic geography to offer insights into the transformation of rural economies. In particular, it focuses on the concepts of path dependence and resilience, and the ways in which these help to explain change within four case study local areas in rural Western Australia. The paper draws on recent advances in dynamic econometrics to examine the ways in the major economic shock of the late 1980s and early 1990s restructuring process 'unlocked' these local economies from existing development pathways and reshaped their trajectories. The paper finds that while common trends were evident across the four case study areas, the ways in which they responded and recovered from the shock were quite different reflecting the diverse ways in which multiscale processes play out across rural space economies.

Walker, B., et al. (2014). General resilience: A discussion paper based on insights from a catchment management area workshop in south eastern Australia.

This report presents the outcome of a workshop that addressed general resilience in five catchments in south eastern Australia.

Walker, B., et al. (2004). Resilience, Adaptability and Transformability in Social–ecological Systems. *Ecology and Society* 9(2), 5.

The concept of resilience has evolved considerably since Holling's (1973) seminal paper. Different interpretations of what is meant by resilience, however, cause confusion. Resilience of a system needs to be considered in terms of the attributes that govern the system's dynamics. Three related attributes of social–ecological systems (SESs) determine their future trajectories: resilience, adaptability, and transformability. Resilience (the capacity of a system to absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks) has four components—latitude, resistance, precariousness, and panarchy—most readily portrayed using the metaphor of a stability landscape. Adaptability is the capacity of actors in the system to influence resilience (in a SES, essentially to manage it). There are four general ways in which this can be done, corresponding to the four aspects of resilience. Transformability is the capacity to create a fundamentally new system when ecological, economic, or social structures make the existing system untenable.

The implications of this interpretation of SES dynamics for sustainability science include changing the focus from seeking optimal states and the determinants of maximum sustainable yield (the MSY paradigm), to resilience analysis, adaptive resource management, and adaptive governance.

Wang, S.-H., et al. (2012). Resilience analysis of the interaction of between typhoons and land use change. *Landscape and Urban Planning* 106(4), 303-315.

Recent typhoons impacting Taiwan have produced heavy rains and flooding, causing tremendous property damage and human casualties. Interactions between typhoons, urban sprawl and economic development are rapidly changing social-ecological systems, increasing the sensitivity of peri-urban areas and their natural environments. These complex dynamic human–environment interactions can be studied using a resilience approach (Anderies, Walker, & Kinzig, 2006; Carpenter &

Brock, 2004; GLP, 2005; Gunderson & Holling, 2002; Schouten, Heide, & Heijman, 2009; UGEC, 2005; Walker & Salt, 2006). This paper presents a resilience analysis approach to evaluate the probability that Taiwan's social-ecological systems can resist changes associated with an increased frequency and intensity of typhoons. This resilience analysis is composed of three parts: system performance (SP), recovery duration (RD) and recovery efforts (RE). It examines changes in the resilience of social and ecological systems to typhoons and is applied to the Taipei-Taoyuan area using Geographic Information System (GIS) software. The results of the analysis show the changing patterns of system performance (SP), recovery duration (RD) and recovery efforts (RE) in response to changes in land cover and extreme weather, which degrade ecosystem services.

Weichselgartner, J. & Kelman, I. (2015). Geographies of resilience: Challenges and opportunities of a descriptive concept. *Progress in Human Geography* 39(3), 249-267.

In disaster science, policy and practice, the transition of resilience from a descriptive concept to a normative agenda provides challenges and opportunities. This paper argues that both are needed to increase resilience. We briefly outline the concept and several recent international resilience-building efforts to elucidate critical questions and less-discussed issues. We highlight the need to move resilience thinking forward by emphasizing structural social-political processes, acknowledging and acting on differences between ecosystems and societies, and looking beyond the quantitative streamlining of resilience into one index. Instead of imposing a technical-reductionist framework, we suggest a starting basis of integrating different knowledge types and experiences to generate scientifically reliable, context-appropriate and socially robust resilience-building activities.

Welsh, M. (2014). Resilience and responsibility: Governing uncertainty in a complex world. *The Geographical Journal* 180(1), 15-26.

'Resilience' has risen to prominence across a range of academic disciplines and political discourses. Situating resilience theories in historical context the paper argues that the resilience discourse of complex adaptive systems, for all its utility as a means for conceptualising and managing change, is allied with contemporary governmental discourses that responsabilise risk away from the state and on to individuals and institutions. Further, in arguing that resilience theories originate in two distinct epistemological communities (natural and social science) in its mobilisation as a 'boundary object' resilience naturalises an ontology of 'the system'. Resilience approaches increasingly structure, not only academic, but also government policy discourses, with each influencing the development of the other. It is argued that by mobilising 'the system' as the metaconcept for capturing socio-natural and socio-economic relations resilience theories naturalise and reify two abstractions: firstly, the system itself – enrolling citizens into practices that give it meaning and presence; secondly, the naturalisation of shocks to the system, locating them in a post-political space where the only certainty is uncertainty. With reference to an emerging governmentality through resilience, this paper argues for a critical interrogation of plural resilience theories and wonders at their emancipatory possibilities.

Wilson, G. A. (2012). Community resilience, globalisation, and transitional pathways of decision-making. *Geoforum* 43(6), 1218-1231.

This article investigates the impacts of globalisation processes on community resilience. It argues that theoretical concepts such as transition theory can provide a lens through which resilience pathways at community level can be better understood, and proposes a framework focused on a social resilience approach for understanding community resilience as the conceptual space at the intersection between economic, social and environmental capital. It argues that certain types of

communities are losing resilience through increased embeddedness into globalised pathways of decision-making, while other communities may be gaining resilience, although not one system is either totally resilient or totally vulnerable. Striking the right 'balance' between communities and their scalar interactions with the global level is key for maximization of community resilience: while too much isolation of a community may be bad in light of over-dependency on local resources, skills and people, 'over-globalisation', with possible loss of autonomy and identity, may be equally fraught with problems. In particular, relocalised communities have, so far, not shown much tangible success, as almost all members of the relocalisation process at community level are simultaneously embedded within the global capitalist system through their dependencies on global economic processes.

Wilson, G. A. (2015). Community Resilience and Social Memory. *Environmental Values* 24(2), 227-257.

The notion of 'resilience' is rapidly emerging as a research topic in its own right, with the notion of 'social resilience' rapidly gaining importance. Yet, due to the relative novelty of the research field, discussions about processes of social resilience are not yet fully developed, especially with regard to how the inbuilt 'memory' of a local community helps shape resilience pathways (social memory). Interlinkages between social memory and community resilience are the focus of this study, with emphasis on analysis of the importance of rites, traditions and social learning processes for shaping community resilience/vulnerability.

Wolfe, D. A. (2010). The strategic management of core cities: Path dependence and economic adjustment in resilient regions. *Cambridge Journal of Regions, Economy and Society* 3(1), 139-152.

The evolutionary approach to economics hypothesizes that economies change in path-dependent ways, shaped and constrained by past decisions, chance events and accidents of history. These constraints make certain strategies easier to pursue and others less so. Resilient regions engage in collaborative processes to plan and implement change, within the constraints endowed by their existing regional assets, including public and private research infrastructure, and the infrastructure of regional institutions. This paper explores the way these processes have played out in a two core cities in the province of Ontario, Ottawa and Waterloo, over the past decade in response to two major external shocks.

Woods, M. (2014). Family farming in the global countryside. *Anthropological notebooks* 20(3), 31-48.

This paper examines the pressures on family farms from globalisation and the adaptation strategies that have been adopted. Employing a relational approach to understanding the emergent "global countryside", the paper describes the impact of globalisation in terms of the stretching, substitution and severing of the social and economic relations that constitute the entity of the "family farm", requiring adaptations in the strategies of family farmers. It proceeds to outline some of the strategies adopted, including entrepreneurial engagement with global networks, international mobility and resistance. These are then illustrated through short case studies drawing on qualitative and ethnographic research with "globally engaged farmers".

Xu, L., et al. (2015). Resilience thinking: A renewed system approach for sustainability science. *Sustainability Science* 10(1), 123-138.

This paper examines the contribution of resilience thinking for social-ecological systems (SESs) in understanding sustainability and the need to preserve natural resources in the face of external perturbations. Through qualitative and quantitative analysis, the literature survey shows the

increased importance of resilience and its integration into the interdisciplinary area of sustainability studies. By exploring the links between resilience and sustainability, the analysis finds that these two concepts share some similarities and also highlight the differences. The discussion of resilience indicators, measuring criteria, models and management issues reveals how resilience contributes to sustainability science and in what ways the concept can be used to measure resilience in terms of sustainability. Most existing studies emphasise the ecological aspects of resilience, but only by including human activities in the modelling can resilience thinking inform sustainability in a meaningful way. The paper concludes defining issues requiring further investigation, such as identifying and managing the drivers and key elements of resilience in SESs, exploring the dynamics between critical variables of SESs and the system feedbacks to external perturbations, as well as evaluating policies and engaging stakeholders for building resilience.