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Resilience in a Changing Community Landscape of Coal Seam Gas: Chinchilla in Southern Queensland

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Abstract

This paper examines community responses to a rapidly changing social and economic environment through the theoretical lens of community resilience. The paper adopts an integrated approach to community resilience, incorporating aspects of social-ecological systems and psychological adaptation to change (Berkes and Ross, 2012), to describe a community of approximately 5,000 residents (Chinchilla in southern Queensland) responding to changes in the face of a burgeoning coal seam gas industry. Rather than centring analysis solely on social impacts and a community's vulnerabilities, the resilience approach investigates responding to change and resilience building qualities. We investigate this at the community group level in a context of CSG, addressing the research question: what aspects of community group functioning assists them to be resilient, and contribute to wider community resilience?

Analysis of qualitative data from approximately 80 participants (including key stakeholder informants and focus group participants) in October and November, 2012, together with media and public documents, suggested a community responding and adapting to change. We identify five dimensions particularly important for community group resilience: strategic thinking, links within communities, effective use of resources, commitment, and building meaningful relationships. We suggest that these dimensions, and the qualities underpinning them, also contribute to resilience of the wider community. A diversity of groups, groups acting as bridging organisations, and groups involved at different scales all provide resilience to the wider system. Understanding how a community affected by coal seam gas demonstrates resilience enables policy makers to support and enhance strengths that are emerging within the community. Moreover, it suggests ways of building resilience in communities potentially facing future CSG activities.

Keywords

Adaptive capacity, coping, social capital, strategic action, unconventional gas

Cover Page Footnote

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Introduction

Arrival of a coal seam gas (CSG) industry to a rural community is associated with significant change. As impacts of CSG are unfolding, the social, economic and environmental assessments point to a combination of benefits and costs to local communities. Common to these types of assessments is a focus on vulnerabilities and weaknesses inherent within the community, with recommendations centred on reducing such impacts (Maguire and Cartwright, 2008). However, in this paper we use a strength-based approach and report on a community's responses to change in a CSG context. Drawing from resilience theory we present a description and analysis of community resilience in practice. Resilience thinking is useful in this context because it focuses on a community's ability to respond to change, rather than assessing whether changes have been beneficial or costly. A resilience approach is capable of progressing our understanding of how communities are adjusting. We focus on resilience at the community group level and suggest that this contributes to resilience of the wider community. In this study, the wider community refers to residents in a geographical location, that is, Chinchilla township and surrounds. The township is located in southern Queensland, Australia.

The paper opens with a discussion of an integrated model of community resilience theory to provide a framework for analysis and discussion. An integrated model combines the concepts inherent in a socio-ecological systems approach to resilience with the characteristics identified in the psychology, community development, and wellbeing literatures as important to resilience (Berkes and Ross, 2013). In addition, we present a description of the contextual factors related to CSG activity that demonstrates the complex and unpredictable nature of the changes that CSG communities face. Results are presented as narratives of community group functioning and we identify qualities that foster group resilience. Finally, we discuss our findings in the broader theoretical framework of integrated resilience, not only to highlight key qualities and dimensions of group resilience, but also to show how this contributes to wider community resilience. Additional factors that could enhance community resilience in this context are also discussed.

Theory

Resilience is a concept used in a range of literatures and there is growing support for the idea that resilience thinking can provide insights to assist a community when faced with significant and rapid change. Not surprisingly, resilience has a variety of meanings reflecting various research fields. Contemporary definitions from the social-ecological systems literature describe resilience as “the capacity of

social ecological systems to adapt or transform in response to unfamiliar or unknown shocks” (Carpenter et al., 2012, p. 3249). Whereas, Magis (2010, p. 401), describes community resilience as “the existence, development, and engagement of community resources by community members to thrive in an environment characterised by change, uncertainty, unpredictability, and surprise”. The use of 'thrive' as a yardstick of functioning incorporates notions of resilience from the wellbeing literature where thriving is viewed as fundamental to the social conception of wellbeing (Armitage, Béné, Charles, Johnson and Allison, 2012). Theorists suggest that inclusion of social dimensions within a systems approach to understanding resilience provides a richer understanding of the concept (Armitage et al., 2012; Berkes and Ross, 2013; Couthard, 2012). Moreover, combining social dimensions and systems principles encourages researchers across multiple disciplines to use a more comprehensive, integrated, and holistic framework for thinking about community resilience in complex situations (Armitage et al., 2012; Brown and Westaway, 2011).

The literature connects resilience to three main concepts: responding to change, contexts requiring resilience, and resilience-building qualities. First, the notion of responding to change is common to all definitions of resilience, and includes adapting or transforming as a way to deal with change. Brown and Westaway (2011), in an extensive review of literature from the human development, wellbeing, disaster and environmental change fields, proffer four possible change responses: coping, self-help, adapting, and transforming. The authors conceptualise the type of response as closely linked to a sense of agency. Carpenter et al. (2012) describe adapting and transforming as reflecting a ‘generalised’ type of community resilience. The description of responding to change, whether it be coping, adapting, or transforming, depends on the scale of analysis. For example, transformation at the individual level could represent resilience at the regional level (Folke et al., 2010). This concept reflects the nested nature of socio-ecological systems where individuals and community groups are nested within a wider social, economic, and environmental system.

A second aspect discussed within resilience thinking is the type of change that requires resilience. Magis (2010) associates such change with uncertainty, unpredictability, and surprise. These concepts of change point to the importance of recognising change as complex. These attributes of change are also inherent in a socio-ecological systems approach where change occurs within a complex system. The principles of a complex system feature unpredictability, non-linearity, multifacetedness, feedback loops, and variability in scale (Berkes and Ross, 2013). Carpenter et al. (2012), in describing ‘generalised’ resilience, further

describe change as unfamiliar or unknown shocks, and distinguish this type of change from change associated with known hazards such as an earthquake or fire.

Finally, various qualities have been identified in the literature as important to building resilience and these are a mix of individual, community, and systems level qualities. Many of the qualities overlap, suggesting interdependence between the different levels within the overall system. Buikstra et al. (2010) examined resilience at the individual and community level in a study of a south-west Queensland community that faced chronic adversity from severe drought. The findings suggested eleven qualities that promote resilience and are a mix of individual factors, such as a positive outlook and sense of purpose, and community level factors such as infrastructure and social networks. Magis (2010) identified qualities at the community level, and reflects a focus on community resources, engaging and developing community capacity through collective and strategic action. Carpenter et al. (2012) provided qualities or dimensions for generalised resilience at a wider systems level. Table 1 presents each of these perspectives of resilience, listing the different resilient-building dimensions. Table 1 also includes a summary by Berkes and Ross (2013), which represents an integration of individual, community and systems level qualities. They have combined social qualities of community development with resilient dimensions identified in wider systems thinking. Berkes and Ross (2013) particularly recognise the importance of agency and self-organising, concepts from the community development stream, to be integral to activating the other dimensions. The literature suggests that agency, a belief in being able to determine and enact one's goals, is important to resilience and that a strong sense of agency supports a more resilient community (Berkes and Ross, 2013; Brown and Westaway, 2011; Davidson, 2010).

This paper adopts Berke and Ross' (2013) integrated view of community resilience, which emphasises dimensions that support self-organisation and agency within the community. However, it is unclear which of these dimensions are most important for resilience at the community group level, and in the CSG context. This research examines community group resilience in the context of a rapidly expanding CSG industry around Chinchilla in southern Queensland, Australia.

Table 1: Factors important for community resilience

Individual and community level	Community level	Wider systems level	Integrated
Social networks and support	Community resources	Diversity	Social networks
Infrastructure and support services	Development of community resources	Modularity	Community infrastructure
Diverse and innovative economy	Engagement of community resources	Reserves (knowledge skills, and social memory)	Diverse and innovative economy
Leadership	Active agents	Leadership	Leadership
Learning	Strategic action	Feedback	Knowledge, skills, and learning
Early experiences	Collective action	Monitoring	Engaged governance
Environment and lifestyle	Equity	Nestedness	People place relationships
A positive outlook	Impact (Magis, 2010)	Openness	Positive outlook
Beliefs		Trust (Carpenter et al., 2012)	Values and beliefs
Sense of purpose			Agency
Embracing differences (Buikstra et al., 2010)			Self-organising (Berkes and Ross, 2013)

CSG activity around Chinchilla

CSG activity around Chinchilla is occurring within a broad state, national and worldwide context. Globally, in 2010, natural gas generated 22 percent of world electricity and was the second largest source of electricity generation to coal (OECD, 2013); both Australian and world gas consumption are predicted to rise over the coming three decades. Australia has 10 percent of world CSG reserves and is the fourth largest exporter of gas globally (Bradshaw, Hall, Copeland, and Hitchins et al., 2012). The CSG industry is expanding rapidly. Growth of CSG activity in Australia has contributed to above average population growth and increased economic development in resource extraction regions (KPMG, 2013). Both state and national governments recognise the increasing importance of CSG for Australia’s export income (Australian Government, 2011), and the associated growth in employment and state royalties (Queensland Government, 2013).

One of the regions with the highest rate of CSG development is the Surat Basin, located in south-west Queensland and spanning an area of 500 km from east to west (KPMG, 2013). Chinchilla is located centrally within the Surat Basin, and is northwest of Dalby (80 km), Toowoomba (167 km), and the state capital Brisbane (290 km), in the Western Darling Downs Region. Commercial CSG production started near Chinchilla in 2006 (Queensland Government, 2012), and by September, 2012, there were 60 major energy and resource projects listed in the

region; 25 located near Chinchilla (WDRC, 2012). Other developments include underground coal gasification, coal mining, and CSG-related construction. Construction is the second largest industry of employment in Australia's mining areas (KPMG, 2013), and in the Surat Basin includes construction of power stations, pipelines, roads, and railway.

The scale of development and level of concomitant investment has attracted large multinational companies to the region, working in joint ventures and partnership arrangements. In the Surat Basin four major companies are actively involved in CSG development, with two companies more predominant in the Chinchilla area (Advance Western Downs, 2013). In addition, much of the associated construction work is contracted to large national firms, and there are multiple tiers of subcontractors to provide all CSG-related activities. As a result, the Chinchilla community deals with multiple companies, which are large and new to the area; each with their own approaches, reputations, and rules for doing business and operating within the community.

CSG extraction in the Surat Basin is planned to include thousands of wells, with wells clustered in some areas, but commonly placed in grid-like patterns at approximately one kilometre intervals. The extensive spread of wells affects a diverse and large number of landowners. In addition, Fly-In-Fly-Out workers or Drive-In-Drive-Out workers (FIFI-DIDO) are typically employed. They mainly reside in camps that range from 500 to 2000 beds, which are dispersed throughout the region. These workers have their home base in a place away from the Chinchilla area and work extended rosters, such as three weeks on and one week off, returning home on their days off. These practices influence many aspects of day-to-day living such as shopping routines, recreational practices, and community participation (House of Representatives Committee, 2013).

The CSG industry is unfolding in two phases of activity: the construction and operational phases. The construction phase is when demand for labour is highest (KPMG, 2013) and the associated industry construction is in full swing. The operational phase relates to the daily management of drilling and delivering CSG. The construction phase necessitates a large, mobile and temporary workforce, whereas the operational phase requires a smaller, stationary and more permanent workforce. This two-phase roll-out of CSG activity creates potential for uncertainty for the community, particularly for business, in not having a clear understanding of what the future holds in the near to medium term.

In addition to the expanding CSG activity in this region, another significant change to the community is the amalgamation of councils. Amalgamation of local

councils into larger regional councils occurred state-wide and caused significant disruption to many council areas throughout Queensland. In 2008, Chinchilla Shire council was amalgamated with Dalby, Murilla, Tara, and Wambo Shires (and the southern third of Taroom Shire) to form a new regional level council (Western Downs Regional Council). This merger represented significant change for both the council and the community, including: planning and approval processes, management of regional infrastructure, social networks, and local government roles.

As a result of the rapid growth of CSG and related activity around Chinchilla, in combination with amalgamation of council, a context of significant change has emerged for the community. In just six years, Chinchilla has changed from a small, predominantly agricultural community administered by a local council to a rapidly expanding and changing community responding to an influx of CSG activity. Such a rapid increase in development brings social, economic, and environmental changes to the community, which provide a mix of both opportunities and challenges. The changes are multifaceted, unpredictable, uncertain, previously unknown, and of varying scale. We emphasise the relevance of the long-term nature of the changes, and the mix of challenges and opportunities as important to the CSG context. In this context, we address the research question: what aspects of community group functioning assist community groups to be resilient, and thereby contribute to wider community resilience?

Methods

The primary data sources were two-fold: in-depth, semi-structured interviews with key informants; and focus groups and interviews with members from the wider community, based on specific community segments. Supplementary data was obtained from informal interviews, field notes, and a desktop review of reports and the public media. The field work was conducted over two trips during October and November of 2012.

The key informants were individuals who held central roles in organisations or the community, and were able to provide a broad overview of the issues related to CSG development, with respect to their group. They were members of significant stakeholder groups including: landowner organisations, business representative organisations, local council, CSG companies, a regional community consultative committee, a local CSG support group, an indigenous liaison officer for the region, and service providers from education, law enforcement, sport, recreation, and community health and welfare sectors. Twenty-two key informant

participants were recruited using purposive sampling methods. The initial desktop review identified a preliminary list of key organisations in the area, which were then contacted for participation in the study; additional organisations were also included using snowballing techniques. In-depth, semi-structured interviews were used to collect data from the key informants, exploring the group's purpose, activities and connections, and their existing, future and potential responses to CSG-related challenges and opportunities. The key informant interviews were audio recorded and later transcribed.

The participants from the wider community were individuals not holding any particular position within the community, but included because they were identified in the desktop review as part of diverse community segments that were likely to be affected differently by CSG development. The wider community sample included twenty-nine participants reflecting a range of community segments including local business operators, service providers, landowners, CSG workers, long-term town residents, and new town residents. Recruitment for this group of participants was based on initial contact with various community organisations, such as service and recreation clubs, chamber of commerce, and subsequent snowballing techniques. Four focus group sessions, involving twenty-two participants with four to six people per group, were conducted, exploring community changes, both opportunities and challenges, and how the community was responding to change. The focus groups were: 1) women on farms and locally employed; 2) small business owners; 3) long-term residents; and 4) community service providers. To canvas community segments not represented in the focus groups seven additional in-depth interviews were conducted to include larger business enterprises, workers employed in the CSG industry, and new town residents. The interviews and focus groups were also audio recorded and later transcribed.

In addition, a convenience sample of twenty-eight locals from Chinchilla participated in informal interviews by visiting a study caravan set up on the town's main street for this purpose. The study, caravan, and opportunity to participate were advertised in the local paper. The informal and unstructured interviews explored general attitudes toward community wellbeing and change, in the context of CSG activities, and involved local land and business owners, CSG workers, and town residents. We were aware of the potential for self-selection bias and primarily used data from the informal interviews to cross check that all salient issues were investigated in our purposive samples. These interviews were recorded using detailed notes.

The desktop review was conducted over a nine month period from June 2012 to March 2013. It included analysis of publicly available reports and documents, group websites, media releases, and review of print and television media. The desktop reviews helped to identify key informants and relevant community segments, and to provide additional background and context to matters raised in the interviews and focus groups.

The transcribed data and interview notes were coded into initial themes. These themes were a combination of themes developed from the resilience literature (Berkes and Ross, 2013) and our own additional themes that emerged from the data. The initial themes were then clustered into higher order groups to best represent broader dimensions. Nvivo version 10 was used to manage data and assist in the coding and analysis process.

Results

The results are presented in two sections: community perceptions of CSG activity, and community group functioning. Community perceptions of the CSG activity provide an understanding of the complex environment within which community groups need to respond. The second section presents storylines or narratives from community groups to exemplify important aspects of group functioning that demonstrate resilience qualities.

Community perceptions of the CSG context

The changes associated with development and expansion of the CSG industry coinciding with amalgamation of council created an environment where change was perceived as occurring rapidly and with minimal forward planning; government decisions and responses were viewed as ‘occurring on the run’. Participants described the change as ‘a tsunami of change’ or a ‘wave of change’ and that all parties were ‘learning as we go along’. For some community members, the size of the companies and the CSG industry more generally, acting with apparent government support, appeared to give rise to perceptions that CSG activity was ‘a fait accompli’ and a sense of powerlessness to slow or reverse change. The best way forward for some was viewed as “we just need to get on with it”.

Getting on with it not only meant dealing with the development of the CSG industry, but also to adjusting to council changing its focus from local to regional governing. New relationships were developing between council and citizens, and a new level of expectation was emerging regarding the functioning of the council.

There appeared to be a community perception that ‘council was struggling’ with a general lack of trust towards council’s capability to be dealing with the considerable changes associated with CSG activity. However, the community appeared empathetic to the council situation, which they perceived as under-resourced and overwhelmed, with council reverting to its core business focussed on ‘rates, rubbish, and roads’.

Community perceptions of change were also a mix of opportunities and challenges. Not only were views diverse within the community, but also varied within the individuals themselves with many individuals “seeing both sides of the coin”. The perceived opportunities from change that included: improved employment options especially for young people, improved house prices for home owners, business growth, improved emergency health services, and a more vibrant community. However, the two-phase roll-out of CSG activities (construction and operation phases) seemed to create added uncertainty for some in the community, particularly for business. There appeared not to be a clear understanding of what the future held in the near to medium term. Consequently, business operators perceived risk associated with business expansion and planning for growth. Some business operators, who seemed confident in their understanding of the future in terms of population growth for the region and associated needs, saw the future as an opportunity. Others, who felt less sure about the future, saw the future as challenging to their business. There were other perceived challenges including: a concern for water and land management both within the town and on surrounding farms, road safety and traffic conditions, fair compensation and land access arrangements for landowners affected by CSG wells, involvement of local business in CSG-related activity, labour shortages, and affordable housing. Perceptions that the FIFO work practices appeared to inhibit the integration of CSG workers into the community and limit their participation in community activities and groups also caused community concern. This lack of community involvement was interpreted by some locals as a disinclination, on behalf of the worker, to be ‘part of the community’. Clearly CSG was perceived as offering both opportunities and challenges, or a mixture of both; however, it was unclear as to the actual extent of these views within the community.

The findings verify that the changes experienced by the community were rapid and complex. Many of the changes were previously unknown to the community, of varying scale, and created a sense of uncertainty and unpredictability. In addition, we highlight the mix of challenges and opportunities associated with the changes as important to the CSG context.

Group functioning

This section uses narratives to demonstrate five major areas of group functioning identified as dimensions that foster resilience, both at the group level and at the wider community level. The areas are: strategic thinking; links within communities; effective use of resources; commitment; and relationships based on trust and respect. Each dimension is underpinned by a variety of qualities (Table 2). The narratives were selected because they exemplify each dimension, and demonstrate its relevance to adapting and responding to change. However, in describing the group functioning there is some overlap to other resilience dimensions and qualities.

Table 2: Resilience-building factors

Group level resilience		Contribution to wider community resilience
Dimension	Qualities	
Strategic thinking	Visioning and planning Leadership Positioning – complementing not competing Harnessing and using information effectively Learning – making sense of previous experience and adjusting future actions Succession planning – looking to the long term	Diversity of groups Caters for differences in the community, which is inherent in the widespread and multifaceted nature of the change Bridging organisations Elevates human and financial resources, provides agency to groups and members of groups
Links within communities	Connectedness Maximising resources Information sharing Learning	Involvement at different levels of scale Addresses the multi-scalar nature of the change
Effective use of resources	Focussed purpose – singular issues Appropriate level of engagement	
Commitment	Commitment Perseverance Place attachment	
Trusting and respectful relationships	Trust Openness Transparency Mutual respect	

Strategic thinking and action

Strategic thinking and action evident among the groups included: visioning and planning, positioning to maximise effectiveness, harnessing and using information effectively, learning, leadership, and succession planning. This suite of actions

allowed groups to adapt and respond to change, and provided them with increased resilience. Groups used mergers with other groups to combine their resources and enable them to operate at a higher sphere of influence, or to financially secure the longevity of the group. Groups positioned themselves to be different from other groups so that their issue was heard, they used information to provide focus and direction to their actions, and demonstrated learning from past experiences. The leading actors of the group were well connected and able to elevate their cause to an appropriate platform, and demonstrated succession planning to ensure the group's vision and purpose were maintained.

One example of a group that used a mix of these actions was a landowner group whose purpose was to ensure 'land, water and health issues were addressed'. The group was a self-organised group that recognised early on that they were not as organised, and their thinking not as developed, as other organisations working in the CSG environment. The group merged with five other groups to focus their activities on water and land-related issues, and commissioned a 'blueprint' report, which set out their main concerns, values, and objectives. The report developed their thinking, visions and objectives and helped to position them to influence change. The landowner group wanted to engage with the CSG industry in a framework of constructive dialogue around issues of concern to them.

When we wrote that [strategic] document, we were very careful to write it in a constructive frame. It seemed to be welcomed by the coal seam gas industry, as much as everybody else, because it was the first time anyone had documented what the real issues were.

While acknowledging the validity of other stakeholder groups, including other landowner-based groups, they positioned themselves as 'a voice of reason', which saw them invited to give input into legislation and policy.

I think the first reason we're influential is that we've not sought to take the revolutionary ground. [Activist groups] can go off and do their demonstrations. ... They've got legitimate reasons to want to do all that, so that's cool. ... But what that does for us, the benefit for us is that gives us some middle ground.

In addition, the landowner group appeared well connected to other agri-political organisations, and was successful at being represented at state level planning, such as the state government's technical advisory committee for strategic cropping land, a committee that could potentially assist the development of a plan to mitigate CSG activity on prime agricultural land. The group is now aiming to transition their activities to larger agri-political organisations, which would then

allow volunteers in the group to return some of their limited time and energy back to their primary activities (e.g., growing crops).

Ultimately, I would like to see [our group] no longer exist, because I think [other agri-political organisations] should do all this stuff, but I actually don't think they picked up speed quickly enough.... So [our group] has filled a void there. ... we've got the GasFields Commission and if they're even handed, they should take on a lot of the things that [we] have been doing.

Links within communities

Links within communities appeared to enhance group resilience and contributed to the resilience of the wider community. Strong links seemed to elevate the human and social capital within the community, facilitated learning, and fostered increased agency to other groups within the community and to individual members within those groups. These links varied from informal connections, through to more formal types of arrangements, or as the purpose of the group itself. One example of a group that functioned as a bridging organisation was a self-organised, business-oriented, regional development group. The group recognised a need to provide cross-scale connection, 'linking local business with opportunity', with the purpose of ensuring that the local business community 'will survive, adapt, and prosper'. The group envisioned a regional role spanning three regional council boundaries, and recognised that "the decisions and impacts taken at one part of the region may have impacts at another". Unlike the regional councils, which are boundary driven, the business community provides goods and services at varying scales throughout the larger region, and see advantages of a development group that can plan across local government boundaries. In seeking support from all three councils, the group hoped to encourage development that was not fractured by territorial issues. Moreover, because CSG companies also operate their businesses beyond council boundaries the group see their role as important, and as one of the few community-based groups that function at this scale.

Some of the functions that the group undertake are information sharing, involvement in planning, and undertaking a coordinating and connecting role to community business groups. An example of the group's information sharing role is the hosting of information and networking events called 'Enterprise' evenings, which are forums that foster the relationships between local business and large regional employers, including CSG companies and major first-tier subcontractors in the CSG industry. The large employer groups, which are often national and multinational companies, attend the enterprise evenings and have the opportunity

to meet directly with local business owners and operators. Typically an enterprise evening is attended by 100 to 150 attendees and is held monthly, rotating between the towns within the region, e.g., Chinchilla, Dalby, and Roma. At an enterprise evening a local business, small or large, has the opportunity to network and learn the ways of dealing with the larger employer groups. For example, a local business can interact with a company contractor and learn about future work prospects, and the processes and nuances of developing a contract and securing ongoing work opportunities with a CSG company or first-tier contractor. Although there are many formal approaches available to businesses to apply for contracts, it is harder to have the opportunity to understand the implicit arrangements involved with the tendering process, and engaging this type of work. These types of information-sharing initiatives are important for a local business community that is “trying to understand how it fits into the picture of doing business with an operator on a much larger scale”. This type of learning helps a community adapt and respond to change in the commercial environment, and fosters long-term economic sustainability. Support from a larger regional development group to smaller community-based businesses is one way the business community as a whole can try to address the perceived unequal power relations that exist between large multinational companies and smaller local business operators.

Effective use of resources

Effective use of resources appeared to not only enhance the efficacy of a group, but also to strengthen the resilience of the wider community. Focussing resources on a single issue and ensuring engagement was at an appropriate scale were two elements of group functioning that fostered resilience. Responding to single issues and at an appropriate scale allowed the community to engage its resources so that its human and financial capital produced the most effective and efficient outcomes. If issues can be addressed at lower levels in the system then they can often be addressed more flexibly and quickly (Folke, Hahn, Olsson and Norberg, 2005).

One example of a smaller scale, and local, response was a self-organised community group that established itself to address drunken and disorderly behaviour. Excessive alcohol consumption and associated disorderly behaviour was a complex local issue and related mainly to the FIFO/DIDO workforce. Police estimated a significant increase in public order offences in Chinchilla over the next three years. “Probably our biggest impact [from CSG expansion] is the public order offences ... [mainly] effects from alcohol-fuelled violence”. As part of a community policing initiative, the group worked proactively and collaboratively to address alcohol-related issues locally and quickly. The group,

under leadership from the local police, comprised key stakeholders, including the CSG companies, pubs and clubs, and developed a co-regulation and zero-tolerance approach, which has proved effective at managing alcohol-related problems.

We had a major issue with one particular contractor... we ended up getting a close relationship, ended up getting a social performance contract drawn up with their workers. So effectively they would sign a contract to say if you are charged with any public disorder offences ... you will be sacked.

The group saw this as an effective and alternate approach to fines, which appeared to be of little deterrence for highly paid CSG workers who don't necessarily reside in Chinchilla. The group also addressed instances of disorderly behaviour by making group decisions to ban problem patrons from all licensed premises for a number of months. "Then all the pubs will say righteo, we're all on board, one in, all in, so they can't come to any pub in Chinchilla for three months". Another outcome of the group's actions was the organising of a bus service from licensed premises to camps at night to reduce loitering after hours, and continuing a Drink Right program for teenagers that had lapsed due to lack of funding.

[The Drink Right program] had fallen over because there wasn't any funding and [our group] said well this has fallen over, we'd really like to do this again but we don't have the funding. One of them, I think it was [a CSG company], put their hand up and said how much is it and we said it's about five grand and they said, yep, we'll pay for it.

In contrast, addressing issues at a larger scale required multiple stakeholders and appeared more bureaucratic and slower to evolve. For example, the Western Downs Regional Council was implementing its Affordable Housing Strategy at a more regional level using a statutory trust and involving key stakeholders (WDRC, 2012). The community response to housing challenges was generally viewed as overly slow, and the outcome as yet uncertain. However, the ability to address larger scale problems was seen as difficult, but necessary, and was testing the resilience of the community.

Commitment and perseverance

Commitment to the group and commitment of the group to its purpose appeared important for the group to be able to adapt over the long term. Commitment seemed to be driven in part by a strong attachment to place or to a way of life. Feelings of connection to their land, their town, their 'rural' way of life were all examples of providing motivation for individuals to be involved in the group, and

for the ongoing commitment of the group to their purpose. One of the stated values of the regional business development group, which had merged, reformed, and persisted in its activities over a period of five years, was “We are fiercely loyal to our region”.

Perseverance and persistence were important attributes as many groups had persisted with their activities over long periods, and endured considerable group change, whilst heavily relying on volunteers to undertake group roles such as chairperson and secretariat functions. For a number of group members, they were maintaining their involvement with the group, yet battling their own issues within their business or personal lives. Some saw this as a potential strain on a community’s human resources and that the availability of people, with suitable skills and abilities, for involvement on committees as dwindling. This quality of commitment and group persistence was important to resilience of their group but could also emerge as potentially difficult to maintain.

Relationship building

Relationships built on trust, openness, transparency, and mutual respect seemed integral to the cohesion of the community groups within the community, and appeared important to both the resilience of the group, and the resilience of the wider community. These types of relationships seemed to take time to form, and were developed through opportunities to work together. One example of a group adapting and changing through an evolving relationship was a local consultative committee. The committee was a constructed group that was established by the CSG company to meet state regulatory requirements. The committee comprised a variety of community-based members, and functioned to inform the community of CSG-related activity, providing answers to concerns that various committee members might raise. In the beginning the intra-group relationships were undeveloped and low on trust. Over the first twelve-month period, the initial Q and A approach provided opportunity for the CSG company to build its legitimacy and credibility by responding to questions openly, providing reports to the committee, answering all manner of questions, and making all responses available to the public. The level of trust had deepened and the group was now poised to take on a more collaborative approach to addressing issues that related to the community’s future and vision. A consultant was being engaged to facilitate this process and to assist the group to develop a strategic plan and to set a course with more focus.

We've moved along that change process to say, okay, we've got information, we've got a sense of what you guys are doing, we've developed relationships with the people within the company, ... we've got a sense of trust with them...[we're ready] to work out what do we

really want with our [communities] what do we want to grow in our communities, and how can these companies help us?

Mutual respect for the other's views and perspectives was seen as integral to meaningful dialogue, and to enable adaptation and adjustment to change. In some instances, levels of understanding between various parties were considered underdeveloped, and if improved could offer opportunity for fostering collaborative engagement that was based on shared understanding.

The coal seam gas companies, their culture and the culture of agriculture are so far apart, in terms of the way they view the world, that we still don't communicate very well ... they're still in the frame of mind that they're consulting with these poor, thick farmers, ... if we both really understood one another a bit better, we might start heading towards, you know, the win-win that must be there somewhere.

Discussion

We discuss both theoretical and practical implications of this study for community group resilience in the context of CSG, and highlight contributions to wider community resilience. In addition, we discuss factors that could enhance community resilience in this context.

Community group resilience

This study identified qualities that provide resilience at the community group level. The qualities are diverse, but have been grouped into five main dimensions for discussion: strategic thinking, links within communities, effective use of resources, commitment, and building meaningful relationships. Underpinning each of these dimensions is a range of qualities, which help groups to respond and adapt to change (see Table 2). Many of these qualities are consistent with findings from other studies and are in line with resilience theory. However, three of these qualities have been under-emphasised in the resilience literature; the reason they emerged in this study could be due to the group level of analysis, or the CSG context.

First, strategic thinking has not been emphasised in all theories, but in the CSG context, and at the community group level, acting strategically seems important to enable the group to adapt and respond to change. Magis (2010) identified strategic thinking and actions as important for community-wide resilience, suggesting this ensures community resources are intentionally engaged, and enhances the community's capacity to respond to and influence change. Strategic thinking

encompasses a range of attributes and is interlinked to efficacy, and agency, which are important to creating innovative change and resilience (Bandura, 2000; Brown and Westaway, 2011; Davidson, 2010). Our research suggests being strategic is especially important in the complex CSG context where there are many difficult issues to address, different levels of possible engagement, and group members with limited time and resources. In addition, acting strategically helps to ensure that group functions complement rather than compete against the functions of other groups.

The importance of commitment, perseverance, and planning for the longevity of the group also seems under-emphasised in resilience theory. Although these aspects have been described by Buikstra et al. (2010) and aligned to a positive outlook, in the context of group resilience these qualities extend beyond being optimistic and demonstrating a readiness for change. This could be because at the group level of resilience, ongoing commitment and planning for longevity of the group is fundamental to the group's ongoing existence (Gooch and Warburton, 2009; Onyx and Leonard, 2010). In this study, commitment seemed to be driven in part by a strong attachment to place and this has been identified as a quality important to resilience (Amundsen, 2012; Berkes and Ross, 2013; Buikstra et al., 2010). The literature suggests that ongoing commitment and group persistence requires support through improved access to funding, effective leadership, development of a shared vision, and management of realistic expectations (Gooch and Warburton, 2009; Byron and Curtis, 2002). Many of these aspects overlap with community groups acting strategically.

A final aspect of group functioning that appears incomplete in the resilience literature is the importance of the factors that underpin trusting and meaningful relationships. In this study, values and beliefs important to relationships included trust, openness, transparency, and mutual respect. Although trust is a component of social capital (Coleman, 1988; Putnam, 2001), in the CSG context trust warrants explicit recognition, especially when the concept of trust relates to the risk of being vulnerable and exploited (Tam, Hewstone, Kenworthy and Cairns, 2009). Our findings indicated there were mixed community perceptions of CSG; for some it was seen as an opportunity, and for others a challenge, and this difference could potentially create distrust and conflict within the community and undermine resilience. In addition, perceptions of unequal power by some in the community also highlight the importance of trust. Trust in this situation becomes integral for effective collaboration (Carpenter et al., 2012; Folke et al., 2005). Similarly, respect has been demonstrated to be important for effective relationships between groups (Lalljee, Tam, Hewstone, Laham and Lee, 2009), and in this study respect for, and understanding of, the other's perspectives was

seen as important for achieving mutually beneficial outcomes. The literature suggests that frequent interactions can build trust (Tam et al., 2009; Bowen, Newenham-Kahindi and Herremans, 2010), and when based on shared listening and understanding can lead to engagement with others from which joint benefits can emerge (Bowen et al., 2010).

Wider community resilience

Our findings suggest that resilience at the community group level contributes to resilience of the wider system in several ways (Table 2). The presence of a diversity of groups of varying sizes allows the multifaceted nature of change to be addressed and provides opportunity for the system to respond to change in a variety of ways (Carpenter et al., 2012). Different groups can cater for diverse needs within the community, and in the CSG context this appears particularly relevant. For example, the widespread nature of the CSG wells means that multiple landowners are affected, each with their own issues and concerns. CSG also affects landowners and towns people differently. Different types of local businesses are each affected by CSG-related activities in their own way; for some as an opportunity for growth, and for others as a challenge to future business. In combination, a diversity of groups, each with their own distinct purpose, can provide resilience to the community by assisting smaller segments of the community to respond and adapt to change. This reflects a view of community, as one not of geographic location, but as a community of different interests and concerns. However, it is important that these different groups complement and not compete for scarce resources. Maintaining open and effective lines of communication, with intergroup interactions acting out of trust and mutual respect would be important to the effective workings of a diversity of groups, and for building social capital within the community.

A second aspect of community-wide resilience was the role of bridging organisations within a community. Not only do bridging groups help to combine and maximise community resources (Folke et al., 2005), but in this CSG context they may also provide increased agency to smaller collectives and the individuals within those collectives. The important role of bridging connections within a community is a feature in social capital theory (Narayan, 1999; Woolcock, 2002), which suggests that when there are abundant ties that cut across social groups it promotes social and economic wellbeing. Thus principles from the social capital literature are relevant to promoting resilience within a community.

We suggest that the more complex, unpredictable, and unknown the change that the community faces the more beneficial the connectedness for engaging and developing resources. Actively developing community resources and support

services is an area important to resilience (Berkes and Ross, 2013; Magis, 2010), and while most groups 'managed' increasing demands on existing resources, strengthening community resources and support could increase community resilience in the CSG context.

Finally, community-wide resilience was enhanced through the presence of different groups that could address problems of different scale. Small, flexible group activity enabled the group to respond quickly and in ways that may be difficult for large groups. However, equally, the need for groups to effectively deal with large-scale problems is important to ensure the multi-scalar effects of change are addressed. The role of the larger scale groups may be to address large-scale issues or to take over the activity undertaken by the smaller group when the scale of the problem elevates to a different sphere. In this study, we saw the opportunity for national groups to take over the stewardship of water and land issues as a way of ensuring the purpose of the collective action was kept alive when the water issues elevated to the national arena. However, the ability to address large-scale problems, such as associated with housing, seemed slow and fragmented. This could be due in part to emerging leadership at this scale, with community perceptions that the council and government were not going to necessarily lead the way on large-scale development issues. Although leadership has been identified in this study under the umbrella of strategic thinking, resilience theory emphasises its importance particularly for resilience of the wider system (Berkes and Ross, 2013; Carpenter et al., 2012; Folke et al., 2005; 2010). Development of collaborative leadership and governance on a larger scale would facilitate planning and managing large-scale issues in this context (Schandl and Darbas, 2008).

Limitations and future research

This study is a qualitative study and whilst we have identified relevant resilient dimensions, the sample is not representative of the entire community population. We are therefore unable to measure the extent of the findings, nor the level of importance of each dimension; this would require a quantitative approach. Rather, this study has aimed for rich description and depth of understanding of each of the dimensions.

In addition, we have used an integrated conception of community resilience (Berkes and Ross, 2013), which implies that the dimensions are interconnected. While this is suggested in our findings (e.g. strategic thinking avoiding competing with other groups and facilitating more effective use of resources; relationship building also forming links within communities; leadership and vision assisting with commitment and perseverance), our study does not examine links between

dimensions in detail. It focuses on identifying the important dimensions and leaves future research to explore links between them more fully.

Conclusions

This research contributes to the resilience literature by identifying five dimensions particularly important for community groups: strategic thinking, links within communities, effective use of resources, commitment, and building meaningful relationships. These findings are consistent with resilience theory, but the first, fourth and last of these dimensions are often under-emphasised in the literature. However, they are important for community groups in this context when working with multiple stakeholders in a rapidly changing and complex environment. In addition, this research highlights three ways community groups contribute to wider community resilience: a diversity of groups can address a diverse range of community issues and concerns; some community groups can act as bridging organisations; and community groups can be involved at different scales.

Using resilience theory, this research identifies gaps that if strengthened could increase the community's ability to adapt and respond to change. Development of community resources and support services, and collaborative leadership to address large-scale problems were identified as areas that could improve resilience at the wider scale; matching resilience to the magnitude of the change. The implications for CSG companies are two-fold. First, as part of their community investment strategies, CSG companies could invest in developing and supporting capability of groups for strategic actioning and building links within the community (e.g., leadership development, funding for activities of bridging organisations, forums that promote intercommunity group communication and shared learnings). A second approach would be to ensure that community engagement, between CSG companies and groups within the community, is based on collaboration and listening, fostering trust and respect as part of a two-way dialogue process. Both approaches build social capital along with community resilience, potentially increasing positive outcomes both for the community and CSG companies (Nahapiet and Ghoshal, 1998).

Community groups are an important layer within the social ecological system. However, community groups are just one layer of actors and their participants are often voluntary. So care must be given to how much is expected of community groups in the context of rapid CSG expansion. Rather, other actors within the CSG industry, government, and not-for-profit sectors could collaborate with community groups to help foster wider community resilience. Moreover, they could support community groups in developing their own resilience, especially

the five most important dimensions identified in this study. As this study shows, community groups can play an integral role in addressing complex issues involving multiple stakeholders associated with a rapidly expanding CSG industry.

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