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Methodological and Ideological Options

Evaluation of social externalities in regional communities affected by coal seam gas projects: A case study from Southeast Queensland

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ABSTRACT

This paper examines the evaluation of social externalities in regional communities affected by four major coal seam gas (CSG) projects in the Surat Basin region of Southeast Queensland, Australia. Using a mixed-methods approach, cross-sectional survey ($n = 428$), and structural equation modelling (SEM) the results of this study reveal community perceptions of rising economic inequality, collective sense of uncertainty about the future, and negative impacts on the standard of living in the affected regions. For example the majority of the respondents are concerned about: the rising cost of living in the area (83.4%), the long-term impacts on groundwater (77.4%), and how their community is being affected (77.3%). We found that perceptions of fairness and inequity weigh heavily, especially on farmers, and correlate to negative psychosocial effects. Our analysis shows that unresolved concerns of community residents about environmental and social issues and the loss of confidence in the local government, contribute to lower life-satisfaction, inhibit the community's ability to plan for the future, and lead to a weaker local economy.

1. Introduction

Globally, an increasing number of agricultural and regional communities are being affected by Coal Seam Gas (CSG) and other large-scale resource extraction projects (Franks et al., 2010; Tonts and Plummer, 2012). In Australia, regional communities, especially the ones that underpin the resource sector, are continually experiencing pressures as the result of rapid economic development associated with major resource projects (Barber et al., 2013; Measham et al., 2013; Tonts et al., 2012). The scale and speed of development of resource megaprojects in Australia over the last decade have introduced numerous new social challenges for regional and local economies such as dramatic inflation of housing and accommodation costs, economic polarization, labor shortages in non-resource-extraction industries, and community cohesion pressures associated with continued expansion of the itinerant workforce (Carrington and Pereira, 2011; Hossain et al., 2013; Petkova-Timmer et al., 2009; Rolfe et al., 2007). As the size and complexity of major resource projects increase, so do their social and environmental externalities.

Studies examining the relationship between the resource sector and regional communities have confirmed that better understanding is required about the socio-cultural dynamics at the community level, and how cumulative impacts of major industrial projects are contributing to variations in community well-being over time (Franks, 2012; Hajkowicz et al., 2011; Tonts et al., 2012). On a broader level, ecological economics and sustainable development literature have long addressed the need for recognition of environmental and social externalities associated with large-scale economic development (Daly and Farley, 2010; Hawken et al., 2010). Externalities are typically not reflected in economic transactions, they do however, have a direct impact on people's welfare and community sustainability, and thus on economic value. Social externalities refer to the positive or negative consequences of an economic activity on social capital and on the quality of life of another (Costanza et al., 2007b).

The fundamental proposition of sustainable development, which focuses on the relationship of what is to be sustained namely ecological and social systems, and what is to be developed namely the economy and society (Brundtland, 1987; Elkington, 1998; Hawken and Niznik, 1992) in principle underpins most corporate social responsibility policies (Anielski, 2002). Furthermore, preserving ecological systems is now a key normative goal in regulatory frameworks and project decision making. This paper argues, however, that preserving social systems and the intangible goods and services they provide is not yet common practice in the resource sector (Thompson, 2008), and is often mixed

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with efforts directed towards earning the social license to operate (Martinez and Franks, 2014).

Increasing scrutiny and a growing demand for greater transparency in the assessment of social impacts are contributing to a shift towards project decision making that meets and maintains the sustainability priorities of the community (Franks, 2012; Haslam Mckenzie, 2013; Prno, 2013; Rolfe et al., 2007). Better understanding of the long term sustainability needs of the community and the multiple interacting drivers that affect quality of life is especially relevant for resource extraction projects with massive footprints, also known as megaprojects (Fischer and Amekudzi, 2011; Flyvbjerg, 2007).

In recent decades, megaprojects have given rise to giga-projects—capital projects greater than USD$10 billion. This transition is driven by the need to compete in the global marketplace and maximize the economies of scale (Galloway et al., 2012; Merrow, 2011). Subsequently cost overruns, delays in completion schedule, and operability problems have also become more common (Flyvbjerg et al., 2009; Williams and Samset, 2010). The pressure to deliver on budget and schedule and reliance on standard institutional frameworks and regulatory practices have yielded significant shortcomings in managing and addressing social externalities (Cheshire et al., 2014). Significant limitations have also been identified in industry's approach to social impacts and the social dimension of sustainability assessment (Colantonio, 2011; Missimer et al., 2010). Lack of standardized techniques for evaluating social externalities in a megaproject context (Magee et al., 2013) has also contributed to shortcomings in minimizing negative social impacts.

Previous studies have demonstrated that communities affected by megaprojects face socio-economic, socio-environmental, socio-institutional and socio-cultural changes and challenges (Carrington and Pereira, 2011; Downing, 2002; Hilson, 2002; Rolfe et al., 2007; Sharma, 2003). In this paper, we present findings and examine emergent themes for evaluating social externalities of major resource projects from a study of ten regional communities affected by four major coal seam gas (CSG) projects in the Surat Basin region of Southeast Queensland, Australia.

2. Study Context

2.1. Site Study Area

The scope of this research study focused on CSG/LNG megaprojects in the Surat Basin in Southeast Queensland, Australia. Coal seam gas (CSG), also known as unconventional gas, poses spatially extensive impacts on rural communities compared to other forms of resource extraction projects, and tends to overlap other land uses, usually agriculture (Measham & Fleming, 2014). The predominately agricultural region of the Surat Basin has experienced a surge of industrial activity, itinerant workforce and rapid economic development as the result of four major coal seam gas/liquefied natural gas (CSG/LNG), starting in late 2006 and peaking between 2011 and 2014 (Queensland Government and D. S. D. I. P., 2014). The projects associated with the Queensland CSG boom are listed in Table 1.

Table 1
Integrated CSG/LNG projects in the Surat Basin (Department of Natural Resources and Mines, Queensland Government).

PROJECT ACRONYM Estimated Construction Value	PROJECT NAME (Operating Company)	PROJECT SPECIFICS
1 APLNG $30 billion	Australia Pacific LNG (Origin/Conoco Phillips/Sinopec)	Joint venture between Origin Energy—37.5%, Conoco Phillips—37.5% and Sinopec—25% Gasfields: Walloons Gasfields, stretching from Injune to Millmerran Pipeline: from gasfields to Gladstone Processing plant and export terminal: Curtis Island, near Gladstone
2 GLNG $30 billion	Gladstone LNG (Santos/Petronas/ Total/KCXiAS/)	Joint venture between Santos Limited—30%, Petroliam Nasional Berhad (PETRONAS)—27.5%, Total—27.5% and KOGAS—15% Gasfields: around Roma, Emerald, Injune and Taroom, Pipeline: a 435 km gas transmission pipeline from the gas fields to Gladstone Processing plant and export terminal: Curtis Island, near Gladstone
3 QCLNG $30 billion	Queensland Curtis LNG (QGC) BG Group Purchased by Royal Dutch Shell in 2015	Gasfields: around Dalby, Chinchilla, Tara, Condimine, Miles. Roma—largest coal seam gas operations in the Surat Basin. Pipeline: gas and water pipeline network of approximately 800 km from the gas fields to Gladstone Processing plant and export terminal: Curtis Island, near Gladstone
4 AI.NG $20+ billion	Arrow LNG (Arrow CSG (Australia) Pty Ltd. (Arrow Energy)—Royal Dutch Shell & Petrochina Company Limited)	Joint venture between Royal Dutch Shell—50% and Petrochina—50% Gasfields: Parts of Darling Downs and Western Downs Pipeline: between Gladstone City Gas Gate and Curtis Island Processing plant and export terminal: Curtis Island, near Gladstone

The Surat Basin is a geological basin that extends across an area of 270,000 km^2. Two thirds of the basin occupies a large part of Southeast Queensland, and the remainder is in northern New South Wales. The communities in this region are situated above the Great Artesian Basin, the largest and deepest artesian basin in the world. The Great Artesian Basin provides the only reliable source of fresh water through much of inland Australia (Habermehl, 2006). The site study area for this research is shown in Fig. 1. The study area included the communities of Dalby, Cecil Plains, Chinchilla, Miles, Tara, Condamine, Wandoan, Taroom, Roma, Injune and the surrounding districts, with an approximate population of 38,000 permanent residents (ABS, 2012).

2.2. Conceptual Framework for the Evaluation of Social Externalities

The purpose of developing the conceptual framework was to guide the empirical investigation of this study by operationalizing evaluation of social externalities of major resource projects from a social sustainability perspective. Research shows that communities that reflect social sustainability are also: equitable, socially connected, democratic, allow for socio-cultural identity and diversity, have access to natural and built capital, and provide the capacity to improve quality of life (Black, 2005; Colantonio and Lane, 2008; Sachs, 1999). In addition, Colantonio (2007) emphasized that social sustainability occurs when formal and informal processes, systems, structures and relationships actively support the capacity of current and future generations to create healthy and livable communities.

The conceptual framework was designed to help understand the role socio-environmental, socio-economic, socio-institutional and social-cultural factors have on perceptions of quality of life in regional