Indicators of Cumulative Impacts in Queensland Gasfields

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Abstract:

How does one best identify indicators of cumulative socio-economic impacts that stakeholders see as salient and credible during rapid resource development in a highly contested arena?

Four major joint ventures are investing $80 billion to tap Queensland, Australia's onshore natural gas resources (IEA, 2012). Twenty years of development has begun, leading to thousands of wells drawing water and gas from deep beneath the aquifers that service a heavily agricultural region that alternates between drought and flood. These developments threaten the farmers' political power (de Rijke, 2013). Nearby coal mining has given some communities the experience of the boom-town cycle (Ennis, et al, 2013; Jacquet, 2009) while other communities are new to the strain on municipal resources – both funding and staff capacity. Gas companies are providing community investment to satisfy requirements of their elaborate, social impact management plans (SIMPs). Their regulation, imposed by a centre-left government, is being reduced by a more business-oriented, centre-right administration at both state and federal levels.

Within this context, we are halfway through a 3-year research project that involves identifying indicators of cumulative socioeconomic impacts (Franks, et al, 2010; Brereton, et al, 2008) via action research, engaging stakeholders from the community, industry, and government (Reed, et al, 2006). This engagement is taking place in a heavily studied area, where the extent of surveying and committee work has induced 'consultation fatigue'.

Findings to date in developing indicators of cumulative impacts on housing, business, employment, liveability, and trust in government provide insight into the allocation of responsibility that is inherent in all such assessments.

Tracking cumulative impacts

Development of mechanisms to understand, measure and respond to cumulative socio-economic impacts is being undertaken to assist a 'resource region' to cope with the effects of four megaprojects to extract coal seam gas (CSG) from rural farm areas. Our focus is on the Western Downs and Maranoa local government areas of Queensland, Australia. They are a few hundred kilometres from the state capital of Brisbane and 500 kilometres from the Gladstone port facility that will export liquefied natural gas (LNG) derived from these gasfields.

We see the cumulative impacts of these megaprojects in line with Franks, et al (2010) as the successive, incremental and combined impacts (both positive and negative) of an activity on society, the economy, and the environment.

Scale and effects of coal seam gas development in Queensland

Approximately AUD$80 billion is being invested in projects meant to run for 30 years in an area with a population of 45,000 individuals. That makes the investment equivalent to AUD$1.3 million per person. Petroleum leases are in the process of being developed on about 10-percent of the land surface in the region, which is covered by modest sized cropping farms and large grazing properties. These farms grew through extensive land clearing, which ended about a decade ago as a result of state legislation.

A farm property of hundreds of hectares may host ten well pads, with associated roads and rights of way for pipelines. Natural gas from the wells is first separated from the water that traps it in coal seams and then collected in compression stations that send it through a network of pipes to the LNG plant in Gladstone. Salty water drawn from the CSG wells - to release the natural gas - is collected in ponds before processing in central, reverse-osmosis plants and subsequent 'productive reuse' by local towns and agriculture. The extraction of water from coal seams is a particular concern on this often parched land, though water released from the coal seams typically lies hundreds of metres below the aquifers employed by farmers. Although CSG development is providing farmers with a new source of water – desalinated water from coal seams - residents wonder whether their treasured aquifers are being drained or being polluted by saltier water leaking from the deeper gas wells.

CSG development has meant a significant influx of construction workers – a surge of activity that is typical of a resource boom. Local residents' concerns relayed by community relations staff of the CSG companies focus on traffic, changes in lifestyle with the influx of new people and local price inflation, and concerns about the availability and quality of water.

Handling cumulative impacts of CSG development

Perceived and anticipated cumulative impacts across several projects present significant challenges for state regulators, who historically have focused on project-by-project approval. CSG company impacts and reputations can become entangled with those of other players – competitors or contractors. Cumulative impacts are a particular challenge for residents and businesses, who are facing a boom and bust cycle on top of those brought on by the effects of rain, drought, and flooding, shifts in international commodity prices (there is extensive export of wheat and cattle from the region), and nearby development coal mines for export.

The extensive environmental impact statement that is required for these CSG projects includes a social impact management plan or SIMP. SIMPs can run to hundreds of pages, representing millions of dollars of effort and months of work by gas company staff and consultants. Each SIMP plays a central role in the state regulator's determination of what the 'project proponent' is given as conditions of operation. However, the SIMP for an individual megaproject does not specifically address cumulative impacts. That is not addressed either by any one proponent's conditioned investments in roads and infrastructure, in social services or facilities, or in ongoing community consultation.

As a result, our academic study to identify 'salient and credible' indicators of cumulative impacts in the region could be seen to have potentially unwelcome implications for the allocation of responsibility for negative cumulative impacts among the CSG companies

and government. However, we are not so much conducting an impact assessment as providing insights and tools – the indicators – to enable dialogue amongst community, industry, and government stakeholders about how best to counteract expected down cycles of the resource boom and take advantage of the large amounts of capital currently flowing into the region.

An uninvited guest – indicators

Our effort builds on the experience in the University of Queensland's Centre for Social Responsibility in Mining in understanding the nature of cumulative impacts and developing indicators of impacts of resource development (e.g., Franks, Brereton, Moran, Sarker, and Cohen, 2010, and Brereton, Moran, McIlwain, McIntosh, and Parkinson, CSRM & CWMI, 2008). Indicators are being selected based on insights gathered from international literature and practice. This background material and how it has been employed in our effort is addressed in a forthcoming article (Uhlmann, Rifkin, Everingham, May, and Head, *forthcoming*).

We have two aims: (1) identification of salient and credible indicators of impact at the regional scale; and (2) ensuring that this information is used to inform the decision-making of key actors.

We have defined 'salient' indicators as those that draw on reliable data and suggest important implications for industry, government, residents, and others. 'Credible' indicators are those that are accepted as legitimate and appropriate by key stakeholders.

In this pursuit, 'consultation fatigue' is a concern as some community members attend multiple consultative committees run by CSG companies and surveys by industry, government, and university researchers are frequent. Members of one town's chamber of commerce rolled their eyes when members of our research team were introduced as 'researchers'.

An action-research approach is being employed to cultivate engagement and increase the probability that insights will eventually be used. That is in part because our project was not invited by government at the local, regional, state, or national level, and it was not cultivated by the coal seam gas industry (although they did provide project funding through the University of Queensland's Centre for Coal Seam Gas). The research proposal was assessed for relevance by representatives from industry and government, but there is no agency or organisation that commissioned our work with the intention to act on the outcomes.

We are not researching alone. There are more than 70 researchers and 30 social science research projects in Queensland and neighbouring New South Wales addressing impacts of coal seam gas development. Our effort appears to be distinctive in its emphasis on cultivating working relationships across sectors, rather than on collecting data *per se*. In essence, our search for indicators is being used to build trust and stimulate systems thinking, the ability to discern how different factors can affect one another.

Cycles of refining indicators

We have enlisted industry and government – represented on a project reference group - in assisting us to identify a pilot set of indicators. These indicators include

factors such as rental prices for housing. These prices have risen steeply in the target area in the past few years as gas company staff and contractors have moved to the area (there is a substantial population of fly-in-fly-out and drive-in-drive-out workers in camps outside the towns).

We are now in the process of 'populating' these indicators – such as obtaining data for the past ten years on rental prices for three-bedroom homes in a target town. This town was selected on the advice of a regional community consultation committee (RCCC) run by one of the major CSG companies. The RCCC noted how the town had experienced a sharp increase in CSG-related economic activity as a result of several of the CSG companies drilling wells and laying pipelines in nearby areas.

Data for our indicator set comes from figures tracked by local, state, and federal government agencies, by peak bodies (e.g., in real estate), by CSG companies (as mandated in their SIMPs), and by other academic researchers.

We have identified a need for indicators of cumulative socioeconomic impacts in the following areas. These indicators may change as we engage in consultation in cycles of refinement. For now, we are counting on other researchers to identify physical and biological indicators of cumulative impacts related to water and the environment, as that is beyond our expertise and resources. Such indicators are, however, necessary for complete scoping of socioeconomic impacts, e.g., in relation to the value of ecosystem services.

1. Housing – sale and rental prices of housing in different market segments and number of CSG workers living in camps.
2. Employment and business – household income distribution, number of local workers in target groups (e.g., women, indigenous) employed by CSG companies and their contractors; also the number of new vehicle registrations.
3. Education and training – the percentage of residents and target groups (e.g., women, indigenous) enrolled and completing training or apprenticeships.
4. Liveability / community well-being – perceptions of change, captured initially in terms of the number of complaints about CSG workers and crime rate statistics as well as data from surveys or interviews on perceptions of CSG company responsiveness.
5. Land and water – level of certainty about water quantity and quality, tracked initially in terms of the number of land-access agreements and 'make-good agreements' (if bore water levels drop) between CSG companies and farmers and the level of satisfaction with these agreements.
6. Governance – perceptions of trust in government; rates, taxes, and royalties paid past, present, and future plus perception surveys by other researchers and industry or government.

The nature of these indicators, once they have evolved through our cycles of consultation, will be discussed in future publications.

Mundane, local, and global

We have learned the following, although others may well have reached these insights in their own assessments of socioeconomic impacts.

1. When assessing regional impacts, one has to account for the history of each community in the region, as each one has a different starting point and a

different capacity to respond. Thus, meaningful indicators need local granularity. As a result, indicators at a regional scale might best be represented in terms of an historical and a geographic pattern rather than as a single number. For example, rapidly rising rents in a 'hub' town represent a different socioeconomic impact than moderated rents in a 'backwater' town 100 kilometres away.

2. A researcher can highlight disparities and stimulate dialogue about how to overcome disparities in the kinds of data gathered on the same topic by different organisations.
3. Indicators that are mundane can be 'ground-truthed' locally. For example, government figures on home rental prices are not as readily accessed as rental prices seen in the front window of a real estate agency that we can demonstrate as roughly tracking the government's statistics.
4. Exogenous factors that can significantly affect residents' welfare deserve an indicator. For an agricultural area, that could include annual rainfall (e.g., flood and droughts) and currency exchange rates as both affect the region's substantial income from agricultural commodities.
5. Local figures can be employed to reflect international forces. For example, the price of fuel displayed at a local petrol station is linked to the level of CSG development activity. The price of natural gas – which determines how much CSG development occurs nearby - currently tracks oil prices. Oil prices affect motor fuel prices. So, the cost of fuel for farm machinery is tied indirectly to the likelihood of more CSG wells being drilled in the region.
6. The cumulative nature of impacts on the regional socioeconomic system can be seen as emergent. It can arise out of conversations about several indicators. For example, a desired increase in young adults staying in the region can drive up housing prices and strain the capacity for childcare, which is understaffed as its pay rates are much lower than those in the resources industry.
7. Messages relayed by indicators can be manifold. For example, a rise in rental prices suggests a strain on residents with low socioeconomic status but also a possible process of 'gentrification' and greater appeal to affluent 'immigrants'.

Conclusions

Our search for indicators employs an action-research approach to cultivate agreement on the nature and likelihood of cumulative socioeconomic impacts of CSG development in a resource region of Queensland. In so doing, we are engaging disparate stakeholders and attempting to overcome the challenges posed by their differing perspectives and interests by finding common ground in the designation of indicators. Through this process, we are trying to turn a daunting task of data collecting and processing into a collective learning opportunity, using indicators as a boundary object (Bowker and Star, 2000) among these groups.

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