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Cultivating collaboration: Lessons from initiatives to understand and manage cumulative impacts in Australian resource regions



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ABSTRACT

Australia has experienced rapid development within its resource regions, with traditional mining sectors like coal, iron-ore and natural gas expanding and new industries such as coal seam gas emerging. As a result, there is an increasing prevalence and awareness of the cumulative impacts of the extractive resource industries on the society, environment and economy of these regions. Collaborative governance is emerging as a means of addressing cumulative impacts. This article undertakes an analysis of 30 case studies of collaborative governance in the resources sector of Australia. The initiatives analysed range from those focussed on information exchange and coordination to higher degrees of collaboration that involve shared resources and shared risks. The study demonstrates that there are challenges in using collaborative approaches to tackle cumulative impacts, but that significant benefits can be realised. The study highlights the need to nurture and cultivate collaborative relationships in order to provide the foundation for long-term solutions.

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Introduction

There is increasing interest in the potential of collaborative approaches to manage the cumulative impacts, or cumulative effects, of resource extraction (Dixon and Montz, 1995; Duinker and Grieg, 2006; Moran et al., 2007; Franks et al., 2010a, 2010b). As there are significant limitations in our understanding of the long-term consequences and complex interactions of cumulative impacts, and of effective ways of managing them, such matters warrant further research (MacDonald, 2000). Yet few studies have examined the characteristics or effectiveness of such responses. This article aims to address this paucity by profiling a range of collaborative initiatives addressing cumulative impacts in Australian resource regions.

The article is structured as follows. The remainder of this introduction provides an overview of the Australian resource sector and cumulative impacts. This is followed by a discussion of the theory and literature regarding cumulative impacts and collaboration. The Method section details the methodology adopted for the study. An overview of the results of the case-study analysis follows, providing insight into the nature of collaborative governance for cumulative impacts initiatives within the

Australian context. In the Discussion section, we highlight the challenges, opportunities and lessons identified.

Cumulative impacts and the Australian resource sector

Australia is one of the world's largest exporters of mineral and energy resources. Coal, iron-ore, base metals, precious metals, oil and gas resources are extracted on a large scale and contribute 8% of Australia's GDP. Table 1 shows Australian minerals and energy exports between 2001 and 2011 by value and volume.

The Australian resource industry has expanded significantly during the past decade. The Australian Bureau of Resources and Energy Economics reported in April 2012 that 98 mineral and energy projects were at an advanced stage of development representing capital expenditure of AUD\$260.8 billion. Less advanced projects within the development pipeline represented a further AUD\$243.3 billion in potential investment (295 projects; Bureau of Resources and Energy Economics (BREE), 2012b). The acceleration in minerals and energy production and the overlapping developments in the agricultural, infrastructure, and tourism sectors are leading to a range of complex interactions. Cumulative impacts result from the aggregation and interaction of impacts on a receiving environment, social group or economic unit (Franks et al., 2010a, 2010b, 2011). They may result from past, present or potential future activities. While there have been

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Table 1

Australian minerals and energy exports.

Sources: Australian Bureau of Agricultural and Resource Economics (ABARE) (2003, 2010), Bureau of Resources and Energy Economics (BREE) (2012a, 2012b).

Resource	Volume			Value (million SAUD)		
	2001	2011	Change 2001–2011 (%)	2001	2011	Change 2001–2011 (%)
<i>Exports</i>						
Iron Ore and pellets (kt)	156718	438830	180	5231	59314	1034
Black coal (Mt) ^a	198.9	291	47	13330.5	31348	135
Oil (ml) ^{a,b}	23936	18042	–25	6390	12291	92
LNG (Mt) ^a	7.6	18.9	148	2613	11147	327
Copper (kt) ^c	754	905	20	2318	8755	278
Nickel (kt)	188	217	15	1835	1376	–25
Zinc (kt)	1484	1574	6	1669	2446	47
Uranium (t) ^a	7367	7017	–5	360.7	705	95

^a 2001 values are for 2001–2002.^b Crude oil and other refinery feedstock.^c All ores, concentrates, intermediate products and refined metal.

significant positive cumulative impacts arising from resource development (particularly at the state and national levels) the changes induced by resource development have resulted in a range of significant environmental, social and economic challenges, including:

- increased airborne dust and pollutants, especially surrounding mining and energy developments;
- effects on water quality from mine site discharge and drainage, and water quantity from drawdown;
- amenity impacts, including visual amenity, noise, vibration and subsidence;
- housing and social service shortages as a result of population increases;
- land-use conflict, particularly in relation to high quality agricultural land and urban fringes;
- disproportionate inflation and two-speed economic activity at local, regional and national levels; and
- impacts on biodiversity and ecosystem services.

Each of these impacts is directly or indirectly linked to complex social or bio-physical receiving environments and each involves incremental and combined effects and complex feedback processes. Impacts have arisen from both the addition of material to receiving environments (sink impacts) and the extraction of natural, social, human or economic resources (source impacts). Awareness of cumulative impacts within Australian resource regions is growing along with recognition that many cannot be adequately addressed by regulation or by individual companies working alone.

Background: Cumulative impacts and collaboration

Where there is shared responsibility for creating the impact, or difficulty in assigning responsibility, initiatives to address cumulative impacts increasingly adopt collaborative governance strategies, involving not just project developers but government, community and other industries as well (Franks et al., 2010a). Because of the complex and far-reaching nature of cumulative impacts, the fact that a multiplicity of actors are often involved, and the need to understand a system (and hence pool various sources and forms of knowledge, expertise and other resources) collaboration is an essential aspect of building successful and sustainable responses to cumulative impacts (Moran et al., 2007;

Dixon and Montz, 1995 and Duinker and Grieg, 2006). Collaborative governance may provide valuable opportunities to address problems characterised by complexity, uncertainty, interdependency, resource deficiency and knowledge differences (Lockwood et al., 2010).

Collaboration refers to the joint efforts and sharing of views and resources by multiple parties to explore and solve problems in a way that extends beyond individual capacities and uni-linear visions and aims to achieve mutually desirable outcomes (Gray and Wood, 1991 and Selin and Chavez, 1995). A collaborative approach may be motivated by a crisis, the complexity and scale of the problems, necessity for coordinating activities or planning, desire for efficiency and reduced transaction costs, awareness that a problem requires collective action, to mobilize and focus resources, and/or commitment to involving stakeholders (Gray and Wood, 1991; Selin and Chavez, 1995; Lockwood et al., 2010; Huxham et al., 2000). In the case of private sector participants, particularly from the mining and energy sectors, such motives may be linked as much to maintaining constructive relationships with community stakeholders (social licence to operate) as to market imperatives or compliance requirements.

Franks et al. (2010a, 2011) identify a suite of management strategies for cumulative impacts, which require different degrees of maturity of collaborative relationships (information exchange, networking, partnerships for program implementation, coordinated community engagement, industrial synergies, multi-stakeholder monitoring, regional planning, and collective management of data). Canter and Ross (2010) outline similar strategies for what they have termed cumulative effects assessment and management (CEAM). In this paper we adopt a continuum of four strategies for working together: networking, coordinating, cooperating, and collaborating (after Himmelman, 2001; see Table 2). Franks et al. (2011) further identifies eight steps for responding to cumulative impacts that may guide collaborative efforts:

- (1) Determine the priority entities within the receiving environment.
- (2) Define the system to be understood.
- (3) Determine how the impacts are accumulating with reference to priority entities.
- (4) Determine what actions are contributing to the generation of impacts and by whom.
- (5) Evaluate the strategies available to respond depending on the circumstances.
- (6) Decide whether to collaborate and with whom.
- (7) Monitor priority receptors of concern.

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