The structural underpinnings impacting rapid growth in resource regions

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ABSTRACT

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Decades of economic restructuring has transformed the nature of work and community relationships in resource hinterlands. Towns once built to accommodate large local workforces are now immersed in much more fluid flows of labour and capital. In some resource regions, proposed mining, oil and gas, and hydro projects may provide potential opportunities to diversify and strengthen communities. However, many community and industry stakeholders have concerns about community capacity and readiness for the anticipated "boomtown" circumstance of rapid growth and development. Drawing upon experiences from Canada, the US, Australia, and Scotland, this research examines structural impediments undermining the capacity of local stakeholders to respond to the challenges and opportunities associated with rapid growth and mobile workforces. Our findings suggest that policies and information structures have not been retooled and redesigned to support mobile workforces. Key structural concerns include obsolete policies and regulations to guide the development, tracking, and decommissioning of work camps; limited information and demographic data about mobile workforces; the problem of different methodologies being used to forecast growth and impacts; underdeveloped information management systems to track the cumulative impacts of single and multiple resource projects; and an absence of orientation packages and information portals for industry and mobile workers.

Keywords: boomtowns, structural barriers, policy, information, labour mobility.

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1. Introduction

More than three decades of economic restructuring has transformed the nature of work and community relationships in resource hinterlands. In some resource regions, proposed mining, oil and gas, and hydro projects may provide potential opportunities to diversify and strengthen communities after years of limited growth. However, community and industry stakeholders have concerns about their capacity and readiness for the anticipated "boomtown" circumstance of rapid growth and development. Rapid industrial activity is expected to increase an influx of mobile workers to address labour shortages, particularly during construction[1] periods. Rapid growth can pose intense pressures and demands for infrastructure and services in resource regions. The socio-economic impacts and disruptions from economic upswings are well described in the 'boomtown' literature (Ennis et al., 2013; Lawrie et al., 2011; Ruddell, 2011; Schafft et al., 2014). Some of the identified issues include inadequate and aging physical infrastructure; increased demand for physical and mental health supports; limited daycare; intense competition for housing; increased demand for community supports; recruitment and retention challenges for a broad range of stakeholders; and increased demand for literacy, basic job skills, and specialized training programs.

Neo-liberal policy shifts, however, are also reshaping the roles of communities, industries, and senior governments in resource regions through the withdrawal of critical senior

[1] The ***construction phase*** is generally characterized by high demand for labour, high numbers of fly-in/fly-out workers, housing shortages / temporary workforce camps, rapid price increases, and heavy demands for public and private services. While the impact is significant, this phase is relatively short, generally lasting three to five years for any specific project.

government policy and program supports (Dufty-Jones and Wray, 2013; Heisler and Markey, 2014). Instead, senior governments are calling upon industries to play a larger role in addressing the social impacts through community impact benefit agreements and social impact management plans (Franks, 2012; Storey, 2010). The maneuvering of senior governments to avoid expenses and obligations has produced a "degree of policy inertia despite calls for urgent government action" in rapidly growing communities (Brueckner et al., 2013, p. 114). This has produced spaces of tension across industries, senior governments, work camps, and communities due to insufficient regulatory and collaborative structures to respond appropriately to the socio-economic pressures in these places (Michell and McManus, 2013). At the same time, valuable information is needed to bring clarity and guide decision-making processes, investments, and long-term working relationships. If communities are going to mitigate challenges and maximize the benefits from large-scale resource development, all stakeholders must exhibit a strong degree of readiness "anchored in a good understanding of the complexity of demographic and workforce patterns" (Rolfe and Kinnear, 2013, p. 133).

Drawing upon experiences from Australia, Canada, Scotland, and the US, this research examines three important questions shaping the capacity and readiness of rural and small town stakeholders to respond to the challenges and opportunities associated with rapid growth and mobile workforces.

- What are the structural underpinnings impacting appropriate responses to rapid industrial growth and large mobile workforces in resource-based communities?
- What are the organizational or process mechanisms where these structural underpinnings play out?

- How are the deficiencies within these structures impacting how regulation, management, collaboration, and decision-making unfold?

The article begins by describing the restructuring processes that have transformed resource regions and increased the use of mobile workforces. After a brief discussion of the limited community capacity to respond to rapid growth pressures, our research is situated within a framework shaped by policy, collaboration, and information structures that support communities experiencing rapid growth. Our findings suggest that policies and information structures have not been retooled and redesigned to support mobile workforces, with corresponding impacts on the viability and livability of rural and small town communities and regions.

2. Restructuring in Resource Regions

Restructuring processes have transformed the nature of work and community relationships in resource hinterlands over the past three decades. Resource towns that were once built to accommodate large local workforces are now immersed in much more fluid flows of labour and capital (Haslam McKenzie and Rowley, 2013). Following the global recession of 1982-1984, government and industrial restructuring focused on shifting away from building new single industry communities, or 'instant towns', in rural resource regions (Peetz et al., 2012; Storey, 2010). Rising costs, lengthier approval processes, increasingly strict environmental regulations, and a reduced role for senior levels of government in town development[2] all supported a shift in

[2] Canada has a long experience with planned resource towns and instant towns (Markey et al., 2012). BC, in particular, put considerable effort into the planning and construction of post-World War II towns to create attractive communities in isolated regions that could better recruit and retain young workers and their families (Gill, 2002). In BC, the Instant Towns Act was created in 1965 to allow the province to "establish a municipality in conjunction with the development of a natural resource" (Province of British Columbia, 1998). Resource-based companies also supported the development of these 'instant towns' in order to stabilize their workforce and reduce their responsibility for maintaining company towns or work camps. It became increasingly costly, however, to deliver

preference towards rotational workforce practices, labour mobility, and long distance labour commuting[3] (Humphreys, 2000; McDonald et al., 2012). Similarly, from an industry perspective, issues of cost, improvements in (and long-term cost reductions to) transportation and communication, the adoption of flexible production techniques, the adoption of extended shifts to support year round operations 24 hours a day, lower turnover and absenteeism, and access to a larger supply of qualified workers also helped to make rotational workforce practices more appealing (Aroca and Atienza, 2011; Markey, 2004; Tonts, 2010). Depending upon the jurisdiction, industries may also able to write off fly-in, fly-out (FIFO) workforce expenses, such as the costs of work camp accommodations, and avoid paying capital gains on 'developed' properties (House of Representatives, 2013; Storey, 2001).

The industry use of mobile workforces has been accelerating since the 1980s (Measham et al., 2013). Mobile workforces have been used by many resource-based industries, starting with the oil and gas industry and expanding to other sectors such as mining, forestry, fishing, hydro, and construction (Ryser et al., 2016; Shrimpton and Storey, 1992). Limitations within the local skilled labour pool, as well as difficulty encouraging skilled labour to relocate to resource-based regions have in part contributed to this change (Storey, 2001). High housing costs in booming communities, limited services, the absence of family support networks, and lifestyle choices have been barriers to encouraging workers and their families to relocate to resource-based communities (Rolfe and Kinnear, 2013).

A second factor shaping the transformation of the workforce concerns industry policies to pursue FIFO workforce operations. FIFO work operations are defined as arrangements to

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programs to maintain the infrastructure in these communities. In 1983, Tumbler Ridge became the last 'instant town' developed in British Columbia.

[3] Long distance labour commuting describes a situation where the workplace is isolated by a distance of at least 200 kilometres from the worker's home community (Öhman and Lindgren, 2003). The literature uses other terminology to refer to labour mobility, including fly-in, fly-out (FIFO), which we will use for this article.

support workers who do not live within a daily commuting distance of a work site (Barclay et al., 2013). The use of FIFO can be traced back to the 1950s when it was used to support offshore oil and gas activities in the Gulf of Mexico (Storey, 2001). Workers spend a designated number of roster days on the work site in which food and accommodation is provided nearby, followed by a designated number of roster days in their home community (Storey, 2010). The use of FIFO workforces have varied. In Queensland, Australia, for example, 40% of the workforce in the Bowen Basin is estimated to be FIFO workers (Barclay et al., 2013). Another study completed by the Chamber of Commerce and Industry Western Australia in 2005 found that 47% of all mining employees were employed as FIFO workers (House of Representatives, 2013). FIFO operations have been increasingly used to support short, intensive labour needs associated with construction and maintenance where the short-term nature of work makes it impractical for workers and their families to move repeatedly across various rural and remote locations (Creating Communities, 2012).

In this increasingly mobile labour landscape, work camp operators have emerged as an important additional stakeholder in rapidly growing resource regions. They can be quickly mobilized to address workforce housing pressures and to mitigate broader community housing issues (House of Representatives, 2013; Province of Alberta, 2006). Work camps are also increasingly engaged to support broader employment benefits for community stakeholders, and as a key component to shape long-term legacies for communities via infrastructure investments and skills (Anglo American Services, 2012; Morris, 2012; Storey, 2001).

Within the mining and community impact benefit agreements literature, industry policy is fairly universal in indicating a preference for hiring locally (Storey, 2010). Formal training and education requirements, as well as purchasing preferences to local businesses, are also often

negotiated to strengthen opportunities for the local economy (Brereton and Parmenter, 2008; Solomon et al., 2008). If the required workforce is not available, industry will look regionally, provincially, nationally, then internationally. That said, skills shortages, combined with the highly specialized nature of the work, the large number of workers required, and the short duration of the construction phase means that many resource development projects have come to rely on FIFO workers for construction. This approach has the effect of more broadly spreading the socio-economic benefits of resource development to a wider range of communities, and to diffusing the costs and impacts associated with industry closures (Morris, 2012; Wilson, 2004). Some hold the view that these workforce policies also reflect efforts to de-unionize workforces and reduce benefits for resource-based regions (Argent, 2013; Duke, 2014).

Given that the operations phase[4] of resource industry projects generally employs far fewer workers than the construction phase, the use of FIFO strategies during the construction phase may be necessary, even desirable. Expanding community infrastructure and amenities such as housing, health care, and transportation to accommodate the construction workforce would result in a community that was overbuilt for the operations phase workforce. For the operations phase, however, Newman et al. (2010) argue that FIFO strategies are incompatible with regional development strategies aimed at 'enabling places' rather than simply enabling projects. Instead, the heavy reliance on mobile workforces limits the growth and capacity development of resource regions due to a leakage of socio-economic benefits beyond the region where resource development takes place (Rolfe and Kinnear, 2013; Storey, 2001). In response,

[4] The ***operations phase*** is characterized by a moderate demand for labour, operations job and career opportunities for the local labour force, long-term supply and service business opportunities, measured economic and community growth, and moderate demands for public and private services. While there are fewer jobs associated with this phase, they are long-term and generally well-paid professional and technical positions. Critical to ensuring operations phase success is to create a community with services and amenities that will attract and retain these permanent workers.

some have called for legislation to cap the percentage of FIFO workers permitted, particularly where industry work sites are located near communities (Morris, 2012).

Rapid growth can impose several pressures on communities. Some communities have responded by successfully negotiating industry investments towards transportation infrastructure, recreational facilities, tourism and visitor centres, educational facilities, daycare, health services, housing, and emergency services within their community benefit impact agreements (Brereton and Parmenter, 2008; Haslam McKenzie, 2013). Local governments, however, may not have enough planning and engineering staff in place to respond to the increased pressures, opportunities, and complexities of operations associated with construction phases (Australia Pacific LNG, 2012b). Local government staff must maneuver processes with multiple levels of government and maintain relationships with multiple industry stakeholders, Indigenous / First Nations concerns, and other communities. During planning and construction, there are limited personnel in place to develop and implement MOUs, infrastructure agreements, and development permits, as well as to track and update information on a regular basis. Compounding these capacity limitations, local governments may lose valuable staff to the private sector engaged in the resource development activity.

Understanding the positive and negative cumulative impacts of multiple industry projects across different resource sectors has been particularly challenging for small local government staff (Brueckner et al., 2013; Measham et al., 2013). Management committees have been used as one mechanism to monitor and address cumulative impacts from resource development (Province of Alberta, 2006). High turnover amongst local government staff due to increased housing costs or private sector drain, however, has led to disjointed operations and has exacerbated uncertainty for developers and industry (Haslam McKenzie and Rowley, 2013).

Partnerships between industry and local government have been used to address local government staffing pressures during the construction phase (Australia Pacific LNG, 2012b). Strategic investments in services and infrastructure have also been impeded by a lack of information about the potential demand and impact that mobile workforces have on local services and infrastructure.

Central to our research is the need to develop a better understanding of how structural underpinnings are shaping the capacity to respond to opportunities and challenges associated with rapid growth in resource-dependent regions. These structural arrangements consist of *policies*, *regulations*, *collaboration*, and *information* structures that provide nodes or spaces where stakeholders meet, negotiate, and mobilize the resources needed to respond to issues that emerge from large industrial projects and mobile workforces. Research suggests, however, that the policies and tools that guide horizontal and vertical relationships no longer reflects the changing labour landscape nor the changing relationships between industry, communities, and various levels of government.

Debates in Australia, Canada, and the US have pointed to some structural underpinnings such as policy ambiguity and indifference; unclear roles and responsibilities for industry, community, and various levels of government; limited structures to support coordination across various levels of government; and a lack of accurate information about the scale and scope of industry projects that shape demands for infrastructure and services in nearby communities (Brueckner et al., 2013; Haslam McKenzie and Rowley, 2013; Rolfe and Kinnear, 2013; Schafft et al., 2014). At the same time, neo-liberal policies have been withdrawing government intervention in community development and moving towards localism or 'responsibilising communities' without flexible and supportive policies and resources for communities and

regions undergoing rapid change (Dufty-Jones and Wray, 2013). Underdeveloped structural and governance frameworks, however, can leave small communities ill-equipped to deal with the pressures that emerge from rapid growth (Franks and Vanclay, 2013). Our contribution to the literature is not just to explore how these structural underpinnings no longer reflect the changing labour landscape, but to situate these underpinnings within a typology as a foundation for future research to examine how deficient structural spaces limit the ability of stakeholders to mobilize their social capital and connect with the resources needed to respond to support timely and effective decision-making and investment processes in rapidly growing communities.

3. Methodology

Drawing upon stakeholders from Canada, the US, Australia, and Scotland, 30 key informant interviews were conducted with industry associations, work camp operators, labour, and community leaders in order to learn more about issues that were central to the research. Participants were recruited through multiple methods, including the use of publicly available lists and snowball sampling (Goodman, 2011). A general breakdown of interview participants is shown in Table 1.

Table 1: Interview Respondents (By Region)

Sector	Number of Respondents	% of Respondents
Alberta (Canada)	13	43.3
Newfoundland and Labrador (Canada)	3	10.0
Pennsylvania (USA)	3	10.0
North Dakota (USA)	4	13.3
Australia	4	13.3
Shetlands	3	10.0
Total	30	

Source: BC Natural Gas Workforce Strategy Project, 2014.

Participants were asked open-ended questions to explore workforce pressures, rotation schedules, and work camp / accommodation arrangements; specific requirements or issues raised by industry, community, and senior government stakeholders; and deficiencies with key policies, coordination mechanisms, and information that were shaping timely and effective responses to rapid growth in resource-based communities. All research participants were provided with a copy of the consent form that outlined the purpose of the study, how the research process addressed their anonymity and confidentiality, and the voluntary nature of their participation. During each interview, comments were recorded and notes were taken. A summary file was created for each interview and was sent to individual participants for review to ensure accuracy. After a final summary file was created for each interview, latent and manifest content analysis (Krippendorff and Bock, 2009) was done to identify, code, and categorize patterns and themes that emerged from the data (Andersen and Svensson, 2012). In terms of manifest content analysis, the research team consolidated information about structures that were guiding community and economic development processes in rapidly growing communities impacted by large industrial projects and mobile workforces.

Due to the exploratory nature of these interviews, our intention is to provide a foundation for a more comprehensive investigation and development of policies and structures to support an increasingly mobile workforce in resource hinterlands. Our findings, though, must be placed within some study limitations, including selection bias from the convenience sampling through publically available lists and the impacts that this can have on the external validity of the issues identified through key informant interviews (Reed et al., 2003). When combined with an extensive review of academic articles, as well as reports and evaluations completed by industry,

government, and other organizations, however, these approaches provide a more comprehensive portrait and insight into how policies and information structures are shaping the readiness to support mobile workforces.

4. Results

The findings have been organized around three key topic areas reflecting structural underpinnings of rapid growth in resource regions, including policies and regulations, assessing cumulative impacts, and information needs. To further distinguish each of these structural underpinnings, we focus our discussion on policies and regulations as a management issue, assessing cumulative impacts as a collaboration issue, and information needs as a decision-making issue (Table 2). Each of these topic areas plays an important role in shaping community readiness for large-scale industrial projects and mobile workforces through awareness, planning and preparation, and the mobilization of key assets in communities.

Table 2: A Typology Reflecting Structural Underpinnings of Rapid Growth in Resource Regions

What are the structural underpinnings?	**Where do they play out?**	**Deficiencies in how they unfold**
Policies and regulations – As a management issue	- Environmental impact assessments - Social impact assessments - Social impact management plans - Community impact benefit agreements - Senior government permit processes - Local government permit processes - Local government planning processes	- Complex system of regulations / processes across local governments / senior government ministries - Limited resources to inspect work camps and enforce regulations - Missed assessments / taxation revenues from camps - Work camps established before permits obtained - Work camps not applying for appropriate permits - Lack of clarity about which senior government ministry is responsible to regulate work camps - Limited collaboration / sharing information across senior government ministries - No reporting system to track work camp status - No one stop shop to collate work camp processes - Work camp regulations obsolete - Inadequate camp emergency evacuation regulations

		- Few local governments have work camp policies - Local governments lack expertise to respond to industry / work camp developments - Absence of work camp decommissioning plans
Assessing cumulative impacts – As a collaboration issue	- Environmental impact assessments - Social impact assessments - Social impact management plans - Community impact benefit agreements - Local government committees - Industry leadership groups - Industry organizations - Labour organizations - Local business organizations - Interagency committees	- Towns, senior governments, and industry all use different forecast models - Underdeveloped industry-research partnerships to understand cumulative socio-economic impacts - Underdeveloped collaborative structures to monitor cumulative socio-economic impacts - Social impact assessments completed voluntarily - Community impact agreements / social impact management plans rarely implemented with timely and adequate investments
Information needs – As a decision-making issue	- Environmental impact assessments - Social impact assessments - Social impact management plans - Community impact benefit agreements - Census data collection Community profiles - Industry / work camp tours - Community orientations - Work camp orientations - Trade shows - Industry-community events	- Inadequate socio-economic information - Inappropriate allocation of funding for resource towns based on census counts - Census counts don't capture shadow population - No regional information / workforce database - Lack of funding to support basic data collection - Senior governments / industry / work camp operators lack familiarity with local / regional context to accurately interpret data - Limited sharing of information about projects - Mobile workers have limited information about outreach supports / services - Need current information about community and senior government supports in multiple formats - Absence of community orientation programs to support recruitment / retention

4.1 Policies and regulations

Readiness is guided by policy and regulatory structures through an ability to communicate an awareness of key development issues, and provide direction and expectations concerning the sufficient actions needed to address those issues. Through impact assessments and project approvals, senior governments are responsible for developing the policy and regulatory structures that manage expectations and actions in resource regions (Michell and McManus,

2013). Ambiguous policies and regulations may be a sign that the problem is not well understood or that there is no clear understanding of what action is needed (Rijke et al., 2012). If policies and regulations are inadequate, it will be more difficult to establish clearly defined boundaries for allocating resources and responsibilities to manage action and inaction (Franks and Vanclay, 2013; Poocharoen and Sovacool, 2012).

To start, work camp operators must maneuver within a complex system of regulations across different ministries representing senior levels of government (Northern Health, 2012; Western Australia, 2013). Depending on the camp location, work camp operators must also engage with local or regional governments to address any re-zoning needs and obtain development permits. Regional government bodies are increasingly involved in order to reduce the impacts of work camps on rural property values, and to capture new development for assessment purposes in order to obtain revenue for services used. Despite having these regulatory frameworks in place, limited resources for the inspection and enforcement of regulations has hampered their effectiveness with many camps established and dismantled before regional governments or regulatory senior government agencies become aware of their development (Beamish Consulting Ltd. and Heartwood Solutions Consulting, 2013). During the construction phase, work camps can move around quickly, especially when work is being completed on pipeline projects. The short duration of some work camps means that they are not assessed, resulting in lost tax revenues to support the use of local services and infrastructure.

Concerns were also raised about work camps that are established before permits are obtained. Some work camps were also not applying for appropriate permits that accurately reflect the number of people accommodated in camp. These issues were shaped by a lack of clarity about who is responsible to authorize and regulate work camps. The effectiveness of

regulatory frameworks is impeded by the limited collaboration and sharing of information with no reporting system in place to inform the network of governing bodies that a camp has been approved, as well as to track the status (i.e. location, size, operations, and closures) of work camps after they have been approved. Work camp, industry, and community stakeholders advocated for a one stop shop that collated all the processes, regulations, and permits for resource development projects.

Despite the growth of work camps, work camp stakeholders we spoke with felt that regulations and standards that guide the development of work camps have become obsolete. Many work camps employ paramedics, nurses, and even doctors, but regulations continue to discuss the basic provision of first aid kits (Province of Québec, 2014). The regulations also no longer reflect modern designs of heating and water infrastructure in camps. As one work camp operator explained:

> The camp rules and regulations established a minimum requirement where workers can stay. It specifies bed sizes, shower stall sizes, it specifies what meals are going to be served. And that all originates from camps that were "camps". The industry has evolved quite a bit. So it talks about that there's only x amount of rooms can be connected to one furnace. Well a lot of that is obsolete today. A lot rooms have p-vac units attached to them. Or it says minimum water storage of X amount per room. Again, kind of an obsolete quote because our wings are designed to have big water storage and heaters that are centralized (Participant ID #17, 2014).

Some jurisdictions are now asking work camp operators to surpass building code or legislation requirements. Regulations also need to be strengthened to address emergency evacuation and safety issues. For example, in one region, large and fast moving forest fires

prompted government evacuation orders leading to two major concerns. First, there was no clear list to quickly identify and contact work camps for evacuation. Second, with just one road in and out of many camps, the work camp operators, workers, and industry face greater safety risks.

As communities confront the pressures of rapid growth created from large-scale industry projects and an influx of mobile workforces, another key issue is that many municipalities do not have work camp policies. As a result, community stakeholders often feel very conflicted over the location of work camps. While some towns prefer to have work camps located nearby in order to produce more benefits for businesses, other places prefer to have large construction camps located near the industry project site to reduce the disruption to the community.

In addition to location considerations, there are also debates about the type of camp that should be permitted. Closed camps (where movement in and out of the camp is monitored and controlled) are commonly included in the regulatory approval process for a project. There are instances, however, when closed camps are unable to meet the demand for industry projects. With more open camp operations emerging, government regulators are now starting to determine the types of regulatory policies and structures that must be put in place. Through work camp policies and development permit processes (Williams County Board of Commissioners, 2011), local governments are provided with information about the location and layout of the camp facility; the capacity of work camp accommodations; traffic route plans; construction, completion, and decommissioning timelines; service and infrastructure plans; and information about compensation arrangements for impacted property owners (Australia Pacific LNG, 2011; British Columbia and Yukon Territory Building and Construction Trades Council, and Construction Labour Relations Association of British Columbia, 2008). This information helps to guide planning and investments in infrastructure and services.

Work camp operators have also been working with local governments to rewrite zoning bylaws. There is a general sense that work camps do not currently fit well within residential, business, or industrial zoning since they have different building codes, different density concerns, and are temporary in nature. Communities may consider zoning for short-term accommodations such as modular units or motels to support workforce housing. Restrictive parking requirements are also being developed for housing subdivisions to respond to parking pressures created from multiple workers staying in a single family dwelling (City Spaces, 2006). Others are developing zoning for temporary workforce accommodations in order to reduce noise, dust, light, scenic impacts, and other concerns for nearby community residents (Australia Pacific LNG, 2011; Franks et al., 2010).

Relating to the issue of different phases of large-scale industrial projects, experience has shown that it is in the interest of local and regional governments to ensure that work camp operators have a decommissioning plan in place. People we spoke with identified concerns where new camps have been established and then disappeared, leaving communities with the burden of cleaning up waste that is left behind. In Williams County, North Dakota and Labrador City, Newfoundland, decommissioning agreements are tied to each camp permit (Williams County Board of Commissioners, 2011).

4.2 Assessing cumulative impacts

Resource-based economies are experiencing rapid change and have become more connected to the global economy than ever before (Ryser et al., 2014). Booms come faster; busts go deeper. Understanding, planning for, and responding to the cumulative impacts of resource development

has become complicated as community stakeholders must be increasingly ready to concomitantly respond to growth in one resource sector and a decline in another. Community development, however, is about building the capacity to collaborate for both short and long term change so as to respond proactively and meet both challenges and opportunities associated with rapid growth (Walton et al., 2013).

There are also calls for improved industry-research partnerships to better understand socio-economic impacts and inform broader community and economic development processes in rapidly growing communities (Australia Pacific LNG, 2012a). As resource regions experience rapid growth across several sectors (i.e. mining, forestry, hydro, liquefied natural gas, pipelines, etc.), there is a need to ensure that collaborative structures engage industry, local and senior levels of government, and relevant local stakeholders to identify and monitor the integrated nature of cumulative environmental and socio-economic impacts from resource development (Dana et al., 2009; Loxton et al., 2013). In preparation for the cumulative impacts of multiple industry projects (Storey, 2010; URS Australia, 2012), people we spoke with noted that municipalities, senior levels of government, and industry all use different methodologies to forecast growth. This restricts their capacity to establish collaborative synergies and initiatives that would be based on similar information and decision-making structures. In Alberta, Canada, the Oil Sands Community Alliance is currently examining ways to align the forecasting process based on production levels, workforce needs, and splitting it across mining and in situ construction, maintenance, and operations. Population forecasts also need to consider the size, location, and use of closed and open camps to support operations.

Social impact assessments (SIAs), conducted typically as part of the environmental impact assessment process, provide an important baseline and starting point for identifying and

addressing the impacts of industrial development on community infrastructure and services. In most jurisdictions, however, SIAs occur on a voluntary basis only (Franks and Vanclay, 2013; Michell and McManus, 2013). Furthermore, while mitigation strategies may be developed, funding for the implementation of these strategies may not be forthcoming from either industry or senior government. Another potential issue is the timing of the funding, as local and senior governments, as well as industry, often wait until final investment decisions are made before implementing infrastructure upgrades and housing developments, by which time many of the solutions are too late. Within these processes, communities lack the regulatory power to command both the information and timely collaboration needed to support planning and investments for rapid growth. As one community stakeholder explained:

> There's a large amount of effort being put into environmental impact assessments. And that's good. That needs to happen. But with respect to the socio-economic impacts, and I think the use of project accommodations falls in that discipline, there is not a lot of rigour in assessment at the provincial level on that issue. And they're the ones that require… that have the ability to require that information from companies and providers and if they don't ask for it, it makes it really hard for the municipality to get that information because we don't hold the regulatory hammer or the higher order of approval saying we won't give you this approval if you don't provide us with this information. So there needs to be more research being done on the impact of project accommodations on local communities (Participant ID #7, 2014).

In Australia, social impact management plans (SIMPs) have been used as one tool to guide working relationships and protocols between industry and Aboriginal communities. They are completed as part of state approval processes and identify actions that industry and

contractors will do to address socio-economic impacts and infrastructure and support needs associated with resource-based projects (House of Representatives, 2013). SIMPs can benefit industry-community relationships by assisting to build trust and long-term working relationships, by identifying issues early in order to reduce and address costs associated with resource development, and to identify opportunities to leave a positive legacy in communities (Franks, 2012). Local leadership and industry groups have also been used to foster collaboration on broader community infrastructure projects and address the cumulative impacts of large-scale industry projects (Franks et al., 2010; Franks and Vanclay, 2013; Moranbah Cumulative Impacts Group, 2015).

There continue to be several challenges to developing a comprehensive analytical and collaborative framework to address cumulative impacts. To start, community stakeholders we spoke with felt it is difficult to convince industries that while individually they may not exceed socio-economic or environmental impact thresholds, the cumulative impact from industry activity across numerous sectors can exceed acceptable levels. Environmental impact assessments tend to focus on the impacts of individual projects rather than the cumulative impacts from multiple projects that can transcend jurisdictional boundaries (Halseth, 2016). A movement towards regional assessment processes is working to mitigate these issues (Fidler and Noble, 2012; Government of British Columbia, 2014). However, senior governments have provided no guidance or consistent or acceptable methodological approach for cumulative socio-economic impact assessments (Franks et al., 2010; Gunn and Noble, 2011; Haddock, 2010).

4.3 Information needs

For many stakeholders, information is the most valuable commodity to bring clarity and guide planning, decision-making processes, investments, and long-term working relationships. Communities, however, often do not have adequate and timely information about socio-economic impacts to support planning and investments in programs and infrastructure through all the different stages of resource development projects.

With infrastructure and program funding based on census population counts (Morris, 2012), there is a need to review the allocation of funding for resource-based communities that are impacted by mobile workforces (House of Representatives, 2013). Census data is simply not able to capture the shadow population of mobile workers in communities, including those who may be living in work camps, illegal suites, private rooms, and other shared accommodations (Nichols Applied Management, 2003; Province of Alberta, 2006; Ruddell, 2011; Shields, 2012). This is because the Census does not request mobile workers to identify resource-based communities that they spend time in throughout the year (House of Representatives, 2013). Instead, contractors and workers may record the company's headquarters on the Census form. As mobile workforces become an increasingly common feature of the labour landscape, there are calls in many countries for Census forms to request people to identify a second place of residence. This has led to calls for new methods to be developed to accurately measure the extent of mobile workforce practices (House of Representatives, 2013).

During the planning phase, industries would ideally look for community profiles that contain information about the geographic and historical context, socio-economic and labour market data, community stakeholder needs and concerns, community stakeholder relations and conflicts, political and governance structures, economy, businesses, health, education, infrastructure, utilities, natural resources, and safety and nuisance issues (Anglo American

Services, 2012), all in an effort to understand the capacity of community stakeholders to respond to the pressures and opportunities associated with large scale industry projects and guide long-term working relationships. To guide working relationships with Aboriginal communities, industries need information about Aboriginal governance and decision-making structures; social, economic, and cultural structures; dispute resolution processes; an understanding of Aboriginal use of natural resources; the nature of land tenures; and previous relationships and experiences with other resource-based industries. To strengthen recruitment and retention strategies for mobile workforces, industry stakeholders we spoke with also advocated for the development of a regional information and workforce recruitment database (BC Hydro, 2011; City Spaces, 2006).

Three general problems run across the topic of information. The first is that needed information may not exist. As funds to many groups and governments have been relatively reduced over the past decades, support for basic information and data collection has been withdrawn. Second, even where information or data exists, users often misinterpret it through a lack of familiarity with the local / regional context. Third, due to the contentious nature of resource development debates or negotiations, many groups with data or information about projects are reticent to share publically, all of which undermine the collective capacity and readiness to respond to large-scale industrial projects and mobile workforces.

There are several information structures and mechanisms where stakeholders intersect to support new knowledge and capacities, decision-making, investments, and community benefits from rapid growth. Many industrial proponents have policies in place stating that they will show a preference for sourcing services and supplies locally when possible. In some communities, local governments and business organizations have come together to develop a compiled inventory of services and suppliers in the community, including information about their products,

pricing, capacity, and contact information. There is also the opportunity for businesses to develop partnerships that could 'scale-up' sector capacity (e.g. plumbing, electrical). As one community stakeholder from the Shetland Islands noted:

> When Total first came here, they did ask for a list of local suppliers for goods and services, which the economic development unit did compile. So very upfront… they were looking for local suppliers to help generate local income and get businesses on side. So that's really important that businesses get involved and provide information. Council was involved in compiling this information together. I think it's important that the public sector or local government takes responsibility for compiling information about local businesses and suppliers in the local community and that the oil and gas companies put their money where their mouth is and use those local suppliers and companies (Participant ID #20, 2014).

Several trade shows have also been organized to provide an opportunity for industry to meet with local and regional vendors and obtain information about what they could offer.

Community, industry, and senior government stakeholders are also experiencing a steep learning curve to respond to the pressures of mobile workers. While mobile work has transformed rural labour landscapes (Tonts, 2010), the nature of how support services are mandated, funded, strategically organized, specialized, and delivered remains strongly rooted in place (Veitch et al., 2012). As a result, mobile workers do not have access to outreach supports in remote resource-based industry job sites. An up-to-date guide that clearly identifies the stress, anxiety, workplace bullying, and related physical and mental health stresses faced by mobile workers and provides contact information for appropriate supports on-site and in nearby communities is urgently needed (Barclay et al., 2013). As one community stakeholder noted:

> Some of the contractors that I've talked to have said, on a daily basis, we are dealing with either drugs and alcohol or a family situation. We are not professionals with this. We don't know where to go, what to do, how to manage this. There isn't the information or directory (Participant ID#15, 2014).

Health and safety information needs to be accessible in multiple formats as mobile workers have varying technical skills and access to technology. Longer shift schedules in many industrial sites, both construction and operations, do not easily allow workers to obtain brochures from community offices that conform to standard business hours. Instead, a more purposeful and strategic approach is needed to inform and connect workers with activities, services, and amenities through on site presentations, mental health first aid programs, YouTube videos, workforce surveys, and community orientation programs (Australia Pacific LNG, 2012c; Creating Communities, 2012; Mining Industry Human Resource Council, 2008; Torkington et al., 2011; URS Australia, 2012). As resource development moves into the operations phase, there are several opportunities to identify and integrate newcomers into the community "through information supplied by employers, school districts, utility companies, churches, and responses to announcements about the program" (Kassover and McKeown 1981, p. 52).

There can be challenges with using orientation packages as a recruitment and retention tool. During rapid change, orientation packages may never be partially or fully developed due to the limited capacity of local government, tourism, and economic development staff. Orientation packages that are strategically developed for different target groups is a task that can be attended to during slower periods of economic development or with the assistance of local service clubs, committees, and other community organizations. Some community stakeholders suggest that it can also be difficult during the construction phase to effectively use orientation packages to

highlight the positive attributes of living in a community that is currently in 'survival mode' to respond to the intense pressures of rapid growth.

5. Discussion

Rapid growth can pose intense pressures and demands for infrastructure, resources, and services in resource regions. The structural arrangements intended to provide the nodes or spaces where industry, senior government, and community stakeholders meet, assess, negotiate, and mobilize the resources needed to support timely and effective decisions and investments, however, no longer reflects the changing labour and industrial landscape. These structures are critical to support ongoing dialogue, planning, collaborative action, and evaluations to address emerging issues in rapidly growing resource regions.

With the potential for multiple industry projects across several resource sectors, there is no clear timeline for when the intensity of construction pressures might begin and end. It would be a mistake for key decision-makers and community stakeholders to attempt to 'weather the storm'. Readiness is not a one-time investment or attribute that will support successful resource and community development, but is best exemplified by having relevant policy and information structures in place that will inform not only investments but also long-term working relationships. These structures are also critical to communicate clear directions and expectations that will guide the roles and responsibilities of all stakeholders involved. As such, long-term visions and strategies are needed to guide smart investments that will strengthen community and economic development infrastructure and improve the resiliency of the community through boom and bust waves of resource development (Ryser et al., 2014).

Our findings suggest, however, that these structures are not reinforced with legislation and consequences to produce and realize change in these transitioning economies, prompting some researchers to suggest that such processes are little more than a public relations tool for industries and senior governments (Michell and McManus, 2013). Communities remain powerless in this renegotiated landscape as they lack the ability to influence the conditions guiding project approval, yet they continue to bear considerable costs for providing the services and infrastructure needed to support these large-scale industrial projects and mobile workforces (Province of Alberta, 2006).

The effectiveness of governance processes to support rapidly growing resource regions will also be affected by the ability of local and senior governments to understand this unique 'operating' geography. Inadequate information has made it difficult for community and senior government stakeholders to track and respond to ongoing changes that should be implemented through social impact management plans or community impact benefit agreements (Bice and Moffat, 2014). New information management systems are also needed that are capable of supporting synergies and collaboration between industry, senior levels of government, and communities. This includes supporting collaboration across different sectors, jurisdictions, and different ministries in order to make a wiser, more efficient use of resources that reflect rural realities. In the context of rapid growth and mobile workforces, this coordination is especially important given the complexity of this important issue that often requires multiple services and strategies that are often beyond the mandate and capacity of any one organization. While much of the focus in regional development contexts has been on horizontal groups, it is important to strengthen the coordination with vertical, or extra-regional, groups with multi-level political connections in order to enhance access to power across a broader range of stakeholders

(Shucksmith, 2009). Unfortunately, many existing political approaches have failed to nurture these collaborative structures by limiting the coordination and integration across many sectors (Drabenstott et al., 2004).

The capacity and fate of resource-based communities will be determined by the political will of senior levels of government; a will that is showing signs of being volatile in a reinforced neo-liberal landscape as some senior governments reduce, rather than strengthen, requirements and weaken structures to coordinate and address social and economic impacts associated with large industrial projects and mobile workforces as they seek to reduce red tape and respond to industry arguments that such processes are excessively prescriptive (Franks and Vanclay, 2013). Once large-scale industrial projects are approved, senior governments become more silent in these landscapes with outdated policies and regulations, inadequate tracking systems, and limited guidance and resources to enforce the findings and recommendations from community impact benefit agreements, social impact assessments, and management plans. The post-approval structural spaces are not adequately developed and occupied by senior government and, at times, local government engagement. Some researchers argue that legislating community impact assessments would impact the trust and flexibility that could be negotiated more informally (Bice and Moffat, 2014). Our research suggests, however, that an absence of more prescriptive formal processes has led to minimal rather than meaningful and collaborative planning and investments to address socio-economic issues during rapid change. The wide variation in standards and practices adopted through the negotiation and use of community impact benefit agreements, impact assessments, and social impact management plans across various sectors and companies, however, may exacerbate uneven development in rural landscapes and fail to produce renewed capacities and legacies for communities (Michell and McManus, 2013).

In developing countries such as South Africa and Mongolia, however, senior governments are working to embed community impact benefit plans and health and social impact management plans in legislative frameworks to support the broader transformation of disadvantaged resource-based regions (Byambaa et al., 2014; Franks and Vanclay 2013). Through legislation, social impact plans must align with community development plans, include procurement plans for historically disadvantaged companies in the region, pursue joint local partners, and include strategies to address social and economic impacts on communities (Franks and Vanclay 2013). Such efforts could inform the transformations of remote resource regions in developed OECD countries that must now make an important transition from a mature staples economy where there is an underdeveloped capacity within the labour force and local businesses to compete in increasingly high-skilled mobile labour markets and open procurement environments. It is not clear, however, how resource-based communities in these developing contexts are able to leverage any power or influence to ensure community impact benefit agreements and social impact benefit plans are realized through the provision of adequate information, planning, and resources. Franks and Vanclay (2013: 44) admit that the integration of community and regional planning and development are "underdeveloped aspects of the policy in practice".

Stakeholders can also no longer afford to look at each development phase in isolation, but must now invest in structural frameworks that will more effectively bridge responses and opportunities across construction and operational phases of large-scale industry projects. There is a need to better understand the cumulative impacts of resource development on both socio-economic and environmental conditions. Cumulative social impact assessment and management processes should not be a linear process (Halseth, 2016), but rather recursive and ongoing in

response to changing capacities and assets, and changing pressures associated with transitioning economies and senior government policy directions. By better understanding the structural underpinnings, stakeholders will be better informed to make decisions in rapidly growing resource-based regions. Further research is needed, however, to improve the generalizability of these findings and to situate these structural deficiencies within a broader and more comprehensive range of contexts where stakeholders interact and mobilize their social and political capital to rationalize and pursue the resources, investments, policies, and decisions in the most relevant and effective way during periods of rapid change.

In the community development literature, social capital (networks of trust) and social cohesion (processes of interaction that nurture cohesive networks) have been important concepts used to recognize that change is a normal part of development and are instrumental to support the learning and reflective processes that create vast changes and transformations in these rapidly transitioning economies (Sullivan et al., 2014). Therefore, an important next step in this research is to explore how the ambiguities inherent in the political, collaborative, and information structures play out in the interactions across stakeholders, and subsequently, the ability to implement the regulatory, management, collaborative, and decision-making tools used in these renegotiated landscapes. As Halseth (2016, p. 110) further suggests, "it is critical that assessments of cumulative impacts not only account for the status of social cohesion and social capital prior to new economic development initiatives, but are also available to track the impacts on these factors and support the renewal of both during the transitions from project planning to construction, and from construction into operations".

6.0 Conclusion

Following three decades of economic restructuring, resource towns are now immersed in more fluid flows of labour and capital. In this new labour landscape, stakeholders underestimate the complexity of policy, regulatory, and information structures that must be ready to support industry, work camp, community, and government relationships during periods of rapid growth. This research has explored the structural underpinnings that are shaping readiness to respond to the pressures and opportunities in rapidly growing resource regions. A number of the issues raised in this research are not new, but are now situated within a typology as a foundation to further examine the structures that provide the space where stakeholders meet, negotiate, and mobilize their social capital to connect with the resources needed to respond to the needs of large industrial projects and mobile workforces. This information can then be used to retool and redesign better policy, collaboration, and information structures to better support timely and effective decision-making and investments in rapidly growing regions.

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