



Confronting barriers and recognizing opportunities: Developing effective community-based environmental monitoring programs to meet the needs of Aboriginal communities



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ABSTRACT

Aboriginal communities can be negatively affected by resource development, but often they do not have a full opportunity to participate in project review and the resulting monitoring and mitigation activities. Cumulative impacts of resource development are also typically neglected in monitoring protocols that focus on a limited number of environmental values, rather than adopting a long-term, holistic view of development over time and space. Community-based environmental monitoring (CBEM) is emerging as a way to meaningfully include local Aboriginal citizens in the decision-making process as well as the assessment of the long-term impacts of the development of natural resources. We explored opportunities and barriers for developing CBEM programs that meet the needs of small and rural Aboriginal communities that are faced with the rapid and wide-spread development of natural resources. We conducted interviews with a local Aboriginal community, and natural resource management practitioners who could provide perspectives on the application of CBEM to resource management in north-central British Columbia, Canada. Results demonstrate that CBEM offers a locally adapted and culturally appropriate approach to facilitate the participation of Aboriginal communities in natural resource decision making and management. The interpretation of the specific role and purpose of CBEM differed among participants, depending on their objectives for and concerns about natural resource development. However, all parties were consistent in viewing CBEM as an effective method for engaging in dialogue, cooperation, and tracking environmental change. The development or improvement of CBEM programs should consider the efficacy of monitoring protocols, social cohesion and relationships, ability to inform decision-making, and effectiveness of CBEM for the members of the community.

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1. Introduction

Resource development projects typically result in monitoring programs that consider a large number of environmental parameters; however, these programs often fail to fully consider the values and participation of surrounding Aboriginal communities (Lawe et al., 2005 and O'Faircheallaigh, 2007). Applications of scientific methods to environmental monitoring are usually generic and may not accurately represent unique ecosystem processes or local values and perspectives (Fraser et al., 2006). Aboriginal people are local experts that are intimately familiar with the environmental norms on their traditional territories (Berkes et al., 2007). Their culturally defined perception and place in the environment is often termed traditional knowledge (TK): a “body

of knowledge and beliefs transmitted through oral tradition and first hand observation” (Whitelaw et al., 2009, p.205). Multi-generational, cumulative, and adaptive knowledge held by Aboriginal communities from past and current experiences contains a wealth of information specific to a community, ecosystem, or region (Tremblay et al., 2008, Alexander et al., 2011 and Johnson et al., 2015). Traditional knowledge can identify gaps in scientific knowledge, offer alternate interpretations of observations, and provide a more holistic and long-term understanding of the environment (Karjala et al., 2004, Berkes et al., 2007 and Parlee et al., 2014).

Community-based environmental monitoring (CBEM) is “a process whereby non-government organizations, community groups, or individuals participate in long-term monitoring of selected species, habitats, or ecosystem processes with the ultimate goal of improving management of ecosystems and natural resources” (Yarnell and Gayton, 2003, p. IV). CBEM programs can structure and empower the participation of Aboriginal people in information collection, analysis, and decision-making (Lawe et al., 2005 and O'Faircheallaigh, 2007). Including Aboriginal concerns, participation, and knowledge can make monitoring locally

Abbreviations: BC, British Columbia; CBEM, community-based environmental monitoring; TK, traditional knowledge; TLFN, Takla Lake First Nations.

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relevant and of greater value to the community (Gordon et al., 2008). However, this does not necessarily exclude scientific knowledge as there are often opportunities to combine or identify complementarities for each source of knowledge, ultimately improving environmental monitoring and management (Berkes et al., 2007 and Larter, 2009).

Contemporary Aboriginal peoples still maintain a strong connection to the natural environment as these areas help maintain their cultural identity and they are important for subsistence harvesting of plants, fish, and animals (Docherty et al., 2010 and Booth and Skelton, 2011). Thus, many Aboriginal Nations in British Columbia (BC), Canada, and beyond are concerned about the negative impacts of resource development (Booth and Skelton, 2011, Bartlett et al., 2012 and Parlee et al., 2014). In many cases, those impacts are cumulative; these are the “combined effects of multiple activities over space or time” (MacDonald, 2000, p.299). Environmental monitoring has been suggested as part of the approach to assess and regulate cumulative impacts as experienced by Aboriginal people on their traditional territories (TDC, Takla Development Corporation, 2011).

In BC, provincial decision makers are responsible for consulting and accommodating Aboriginal communities when resource development decisions could potentially infringe on or impact Aboriginal rights (Province of British Columbia, 2010). Consultation can help decision makers understand Aboriginal interests, and, where necessary, accommodate their concerns (Nuttall, 2010 and Province of British Columbia, 2010). More generally, understanding Aboriginal interests and concerns will make consultation more meaningful and efficient (Province of British Columbia, 2010). Increasingly, Aboriginal participation in resource management is demanding that consultation address cumulative impacts (Johnson, 2015). For example, the Blueberry River First Nations have alleged that the cumulative impacts of industrial development have violated the province's obligations under Treaty 8, which has resulted in a provincial court challenge (Notice of Civil Claim No. S-151727, 2015).

The BC environmental assessment process evaluates the potential consequences of a proposed project for human and biophysical environments (Docherty et al., 2010 and Place and Hanlon, 2011). Ultimately, the goal of the assessment is to prevent significant adverse environmental, economic, social, heritage or health impacts; this may include mitigation and post-development monitoring, including CBEM (Greig and Duinker, 2011). Although the objectives are clear, the process has been heavily criticized as ineffective and unworkable for Aboriginal peoples (Booth and Skelton, 2011). Docherty et al. (2010) reported that some Aboriginal people felt they were not properly included in the environmental assessment process and that the associated studies were generic and could not fully represent Aboriginal views or TK.

CBEM can play a role in a broader environmental assessment process by satisfying community engagement, explicitly including TK, and providing near-continuous information that documents environmental change (Greig and Duinker, 2011, Herrmann et al., 2014 and Udofia et al., 2015). More generally, Aboriginal communities can use CBEM to build community capacity to better inform decision makers of the interests and concerns of local people (Noble and Birk, 2011 and Herrmann et al., 2014). Additionally, CBEM may create opportunities to work towards establishing a joint decision-making process (Morellato, 2009).

In this research, we identify opportunities and barriers for developing CBEM programs that meet the needs of small and rural Aboriginal communities that are faced with the rapid and wide-spread development of natural resources. Our primary focus is the needs and aspirations of Aboriginal communities. However, we recognise the role of industry and government in proposing, regulating, and managing resource development. This includes the development and support of CBEM programs and the application of monitoring information.

Our perspective is informed by one Aboriginal community and more broadly the understanding and perspectives of resource management practitioners (government, industry), and land managers from Aboriginal communities. Interviews with study participants provided a broad

cross-sectoral understanding of the value and limitations of CBEM. The interviews focused on north-central BC, Canada; however we are confident that the recommendations can broadly assist other Aboriginal communities and their partners in efforts to increase the effectiveness of environmental monitoring programs. This includes addressing cumulative impacts and maximizing the influence of CBEM in the planning, monitoring, and mitigation of resource developments.

2. Methods

2.1. Takla Lake First Nation

This research occurred in north-central BC, Canada, with a focus on the Takla Lake First Nation (TLFN; Fig. 1). Their traditional territory covers approximately 27,250 km² with the administrative center and largest residential community being Takla Landing (Docherty et al., 2010 and TLFN, Takla Lake First Nation, 2015). Approximately 250 members live in Takla Landing with another 1000 TLFN members living on or off reserves in the surrounding territory (TLFN, Takla Lake First Nation, 2015). Members have a strong cultural attachment to the land and rely upon traditional subsistence, such as hunting and gathering for food and medicinal use, which also supports social and cultural functioning (Docherty et al., 2010).

The TLFN has a traditional potlatch governance system in which a ‘keyoh’ (a family's traditional land base) is represented by a family leader during community gatherings (Docherty et al., 2010, p.4). The keyoh is protected by the family, and the holder will “speak for the land” during gatherings (Docherty et al., 2010, p.4). When the Canadian government banned the potlatch system, TLFN adopted the elected Chief and Council governance structure which still exists (Docherty et al., 2010). Today, keyoh spokespeople as well as Chief and Council cooperate in the governance of the TLFN. Federal and provincial governments generally communicate with Chief and Council while neglecting to consult keyoh holders (Docherty et al., 2010).

The TLFN traditional territory has been impacted by mining, mineral exploration, forestry, pipelines, railroads, and resource roads. We met with the TLFN Mining Coordinator in February 2013 to discuss this research. The Mining Coordinator organized a meeting with TLFN Chief and Council in April 2013; the outcome of this meeting was support from TLFN Chief and Council, and following their approval we obtained a Band Council Resolution. TLFN was chosen for this study as the community expressed an interest in developing a CBEM program to address past and increasing industrial development on their traditional territory. Although this study was conducted independently of the community's direct efforts to pursue CBEM, results from this research provided a step towards the development of such a program.

2.2. Data preparation and planning

2.2.1. Interviews

We used qualitative methods to identify cross-sectoral differences and commonalities in the benefits and limitations of CBEM. Quantitative methods (e.g., numerical surveys) were not used as they are restrictive and limit integration of social aspects and values (Winchester, 2008 and Punch, 2014). Single participant, semi-structured interviews were conducted to collect information from resource management practitioners (government, industry), and land managers from Aboriginal Nations in north-central BC. Semi-structured group interviews were conducted with representatives from four different keyohs (a family's traditional land base). Semi-structured interviews provide many benefits for this type of research, including a flexible yet orderly and focused strategy for collecting qualitative information (Kirby et al., 2006 and Dunn, 2008). These methods maintain the integrity of the interviewee's information and allow him or her to lead the direction and ultimately the findings of the research based on what the interviewee deems important (Dunn, 2008).

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