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A strategic analysis of the New Brunswick, Canada fracking controversy

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ABSTRACT

Strategic insights into the previous conflict between the Elsipogtog First Nation and the New Brunswick (NB) Provincial Government are presented using a formal conflict resolution technique. The conflict surrounds the prospect of widespread hydraulic fracturing in NB, one of Canada's Maritime provinces on the east coast of the country. The hydraulic fracturing technique, used for mining natural gas trapped in shale rock formations, has recently received much attention. The process is strongly opposed by some groups, including the Elsipogtog First Nation, primarily due to the potential environmental impacts associated with the technique. Through the application of the Graph Model for Conflict Resolution, it is found that the status quo at the time of the conflict was the most likely outcome in this conflict. The previous Conservative New Brunswick government had a great deal of power in this conflict and it had demonstrated its intention to develop the shale gas in the province in the face of much civil unrest. It is discovered, however, that there is a potential resolution to the conflict that will appease the residents of NB, if a moratorium is issued concerning hydraulic fracturing.

1. Introduction

It is widely understood that the energy derived from hydrocarbons is not sustainable and is, most certainly, an exhaustible resource. This societal reliance has grown exponentially in the past, increasing by 800 fold since 1750 and 12 fold in the twentieth century (Hall et al., 2003). The inevitable depletion of worldwide oil reserves has led to the use of extraction methods that were once not profitable or feasible (Weber, 2012). Hydraulic fracturing, or more commonly referred to as "fracking" or "hydro-fracking," is one such technique. This process allows for the extraction of small pockets of natural gas trapped in shale gas formations through the drilling of wells, using a combination of techniques such as vertical, horizontal, and directional drilling. This shale is generally located at a great distance below the surface, where a mixture of water, chemicals, and sand is pumped under high pressure, creating fractures in the rock, thereby releasing the trapped pockets of natural gas (Environmental Protection Agency, 2013). Concerns regarding the technique arise from various phases of the process but include the large amount of water required, the potential for groundwater contamination at the surface due to improper handling of chemicals, possible seismic disturbances, and also the creation of large amounts of wastewater (Kargbo et al., 2010; Fitzpatrick, 2012). Wastewater produced through hydraulic fracturing may be treated, but in many instances it is stored onsite and pumped back into the well for disposal after all the natural gas has been extracted. Another concern related to natural gas wells is that of fugitive gas seepage caused by inadequate sealing of the wells. Since methane is a powerful greenhouse gas, this may contribute to global climate change (Wigley, 2011).

This natural gas extraction technique is presently being implemented in numerous countries worldwide. The economic benefits from the development of shale gas have also been experienced by a number of countries (Nagayama and Horita, 2014; Paltsev, 2014). Fracking is currently taking place within Canada, but some provinces remain hesitant to implement the practice. This is due to the recent scrutiny and debate surrounding the processes on account of the aforementioned potential environmental concerns associated with the method. There is evidence to suggest that the potential environmental impacts of hydraulic fracturing could be offset by proper management practices, but those opposing the approach remain skeptical.

On September 22nd, 2014, a new NB Liberal provincial government was voted into power, but the conflict contained herein involves the former Conservative government. The previous Conservative provincial government (NBG) was in favor of developing this resource, but many New Brunswick (NB) residents strongly oppose the use of this technique. More specifically, many New Brunswickers believe that the possible environmental consequences related to fracking outweigh the potential royalties from the development of the shale gas. Those opposed include the Elsipogtog First Nation (EFN), who believe that hydro-fracking on their traditional lands will endanger the water and

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wildlife, both of which are held in high regard. Therefore, the central purpose of this paper is to present a detailed strategic analysis of the conflict between the Elsipogtog First Nation and the former New Brunswick Conservative provincial government concerning the potential development of shale gas in NB.

Following a description of the Graph Model for Conflict Resolution (GMCR) and the dispute, Section 2 details the methodology applied for the analysis of this conflict. Section 3 includes a description of the decision makers (DMs) and options, the DMs' preferences, the possible conflict equilibria (resolutions), an analysis of the conflict as a hypergame in which there are misunderstandings, and potential future scenarios, which are examined using the GMCR. The final Sections 4 and 5 discuss conclusions and insights gained from the analysis.

1.1. The graph model for conflict resolution

The conflict between the Elsipogtog community and the NBG was centered on the ownership of land. Crown lands in the province are untreatied, meaning the land was not ceded during colonialization; therefore, the ownership of the land is a topic of much debate. This gave rise to the conflict between the NBG, preferring the development of the shale gas resource, and the Aboriginal community, who greatly oppose fracking and favor the protection of the land. Included is an in-depth historical background to allow the reader to garner an understanding of the conflict and a subsequent modeling and analysis using the GMCR (Fang et al., 1993; Kilgour and Hipel, 2005). The GMCR, a branch of game theoretic models, provides a systematic approach for formally investigating complex real world conflicts and has been applied to both current (He. et al., 2014) and historical disputes (Hipel et al., 2014). Research on conflict analysis has been carried out in a number of disciplines, including psychology, sociology, business, economics, operations research, and systems engineering (Hipel, 2011). More recently, the GMCR has been applied to energy related disputes including the Churchill Falls hydroelectric power dispute and the Ontario, Canada, nuclear power conflict (Armin et al., 2012; Matbouli et al., 2014).

Game theory dates back to the early 18th century (Arrow, 2003), but more recently, the *Theory of Games and Economic Behaviour* published by von Neumann and Morgenstern paved the way for the development of present-day game theory models. Modern game theory was significantly shaped by the work of John Nash in the early 1950s, which prompted a great deal of research into the field of conflict analysis (Hipel and Bernath Walker, 2011). Fig. 1 depicts the two branches of models, which include quantitative procedures and non-quantitative approaches. Both of these types of models have been applied for conflict analyses, but this paper focuses on the GMCR, which falls under the latter approach. According to the authors' knowledge, their systematic study of the NB fracking conflict constitutes the first time that the GMCR has been utilized to gain strategic insight about this type of conflict.

1.2. The controversy

There is currently a worldwide debate regarding the aforementioned environmental concerns associated with fracking. Countries such as France and Bulgaria have banned the process altogether, whereas the United States (US) and Poland feel that research has established the process as being environmentally sound when effectively regulated (Rahm, 2011; Johnson and Boersma, 2013). Shale gas exploration is currently being carried out in several Canadian provinces (Canadian Association of Petroleum Producers, 2013). In Prince Edward Island, however, protests opposing shale gas exploration have led to a ban of the mining technique until the Canadian federal government concludes an environmental impact assessment (EIA) of the process (CBCnews, 2011a; Patterson, 2015).

Also in Canada, the Newfoundland and Labrador Minister of Natural Resources, Derrick Daley, has declared a moratorium on hydro-fracking until public consultation and policies can be put in place (The Telegram, 2013). A moratorium was implemented in Nova Scotia regarding high-volume onshore hydraulic fracturing (MacDonald, 2014). The Province of Quebec has also imposed a moratorium on shale gas exploration in certain areas of the province until the effects of the process can be more clearly understood (CBCnews, 2013g). The enactment of this legislation in Quebec led to a $250 million lawsuit against the Canadian federal government by Lone Pine Resources Inc., who had their natural gas drilling permits revoked by the Province of Quebec. The Canadian Federal Government is being sued under provisions of the North American Free Trade Agreement (NAFTA) and international law, as the company states that they lost a considerable sum of money (and future profits) as a consequence of the moratorium (Beltrame, 2013).

Similar conflicts as that presented herein, in which a First Nation community greatly opposes the development of a shale gas resource, are not an uncommon occurrence. In November 2012, near Kitimat, British Columbia, the Unis'tot'en clan of the Wet'suwet'en Nation evicted surveyors working on the Pacific Trail Pipeline, constructed a road block, and seized equipment (Canadian Press, 2012). Other similar conflicts have occurred in Argentina (Frayssinet, 2014) and the US (Sontag and McDonald, 2014).

1.3. Shale gas in New Brunswick

New Brunswick is home to the Frederick Brook shale deposit located in the southern portion of the province. NB has a long history with respect to natural gas, dating back to 1859, when the Dover natural gas field was discovered. The province estimates the current extraction rate to be 12 million cubic feet (~340,000 m^3) per day, but this is from

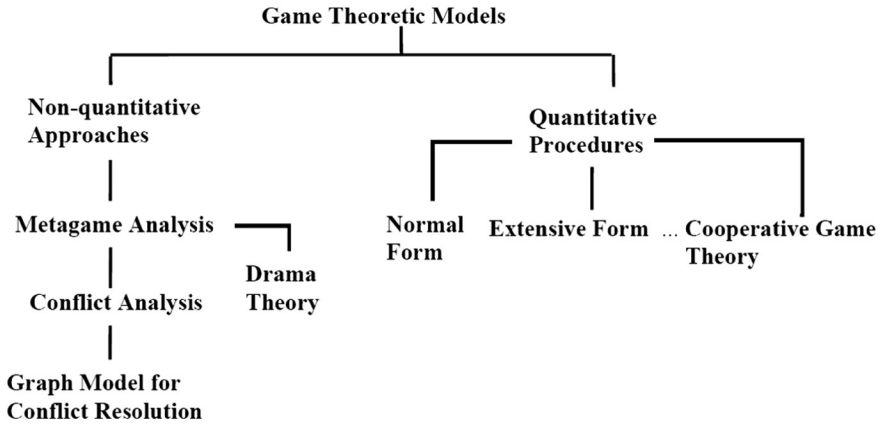

Fig. 1. Genealogy of game theoretic models (Hipel et al., 2005).