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# Transitioning from an economic cluster to a collaborative community: mining projects in Greenland

Maja Due Kadenic

Correspondence: Maja@btech.au.dk  
Aarhus University, Herning,  
Denmark

## Abstract

This paper analyzes the Greenlandic business community and the recently established cluster relevant to extractive industries in Greenland, Arctic Cluster of Raw Materials (ACRM), to enhance local business development in mining projects in Greenland. The analysis directs toward a transition from an economic cluster to a collaborative community in order to increase business potential and to overcome limitations of smallness and inadequate competencies of the Greenlandic business community in the mining industry. Transitioning into a collaborative community creates more value by enabling member firms to realize business development that each single firm could not achieve with its own efforts by being a part of a cluster. Managing the transition process emphasizes the facilitating role for the reason that a shared service provider is required in every collaborative community. I develop a conceptual model for the transition from an economic cluster to a collaborative community based on the architectural elements of the collaborative community design. The conceptual model considers the five proximity dimensions that influence inter-firm linkages both as enablers and barriers to the transition process and collaboration. Collaboration represents a new approach to business and industrial development in remote regions of the Arctic, as challenges evident for Greenland can be found throughout the entire Arctic.

**Keywords:** Cluster development, Collaboration, Collaborative community, Proximity dimensions, Greenland, Mining, Arctic

## Introduction

In recent years, Greenland has attracted global attention as a frontier region of the Arctic for development of mineral and hydrocarbon resources (Nuttall, 2012). Similar to other Arctic economies, the industrial structure in Greenland is dominated by fishing and hunting of very few species (Duhaime and Caron, 2006; Larsen, 2010; Økonomisk Råd, 2012), which emphasizes the vulnerability of Greenland's economy. A mining industry represents an opportunity for economic growth and positive effects on local businesses and employment (Government of Greenland, 2014; Ministry of Foreign Affairs, 2011). Nevertheless, the Greenlandic business community is challenged by size limitations, lack of prior experience with the mining industry and necessary competencies (Copenhagen Economics, 2012; The committee for Greenlandic mineral resources to the benefit of society, 2014; Økonomisk Råd, 2012).

A cluster relevant to extractive industries in Greenland, Arctic Cluster of Raw Materials (ACRM), was established in 2013 by the Confederation of Danish Industry (DI), the Danish Industry Foundation (IF), Greenland Business Association (GA), and the Technical University of Denmark (DTU). The cluster serves as a platform for businesses with interest in the extractive industries in Greenland (Jakobsen and Lyne, 2013). The main purpose of ACRM is to strengthen competitiveness, increase possibilities for subcontractors to mining projects in Greenland, and raise awareness about mineral exploration in Greenland and the Arctic (Arctic Cluster of Raw Materials, 2016; Jakobsen, 2013).

Cluster establishment and collaboration is considered beneficial for the Greenlandic business community in order to increase business potential (The committee for Greenlandic mineral resources to the benefit of society, 2014). I therefore investigate the ability of cluster development and the collaborative approach to enhance local business development and application of Greenlandic businesses in mining projects. In this paper, I apply an in-depth single-case-study design (Yin, 2014) based on data from interviews and supported with secondary data sources such as reports, research, documents, and statistics.

Firms in various industries cohere together in different kind of clusters and networks. Industrial clusters are powerful engines to wealth creation (Mathews, 2012; Ghadar et al., 2012). They cut across traditional industry classifications and are concentrations of interconnected companies and institutions co-located in a specific geographic region and linked by commonalities and complementarities in a particular field (Ketels, 2003; Porter, 1998, 2000; Porter et al., 2004). This represents a new way of thinking about local economies (Porter, 1998, 2000). This is well recognized and object of increased attention (Mathews, 2012). Clusters represent a setting in which both traditional production activities and entrepreneurial and innovative activities take place (Mathews, 2012). Firms that form part of a cluster can accomplish many more activities by having access to more resources over the single, isolated firm, and expanding the market for their products and services (Mathews, 2012). Ultimately, a cluster is a system where interconnections among members result in a whole that is greater than sum of its parts (Porter, 1998, 2000). Firms within clusters do form linkages. Collaboration and linkages between organizations in clusters are influenced by five proximity dimensions: geographical, social, cognitive, organizational, and institutional (Belso-Martinez, 2016; Molina-Morales et al., 2015; Boschma, 2005). Limitation and excess of proximity may prevent successful inter-organizational linkages (Boschma, 2005).

In extension of cluster development, industries are rethinking their business processes (Daft et al., 2010). Firms are increasingly faced with competitive pressures due to continuous adaptation to a dynamic environment (Fjeldstad et al., 2012). In response to the pressing challenges, a new organizational form is emerging, based on a collaborative community design (Bøllingtoft et al., 2012; Fjeldstad et al., 2012; Miles et al., 2010; Snow, 2012; Snow et al., 2011; Snow et al., 2009). Collaboration is a process where at least two parties work together to achieve mutually beneficial outcomes, such as resolving a problem or creating a new business (Miles et al., 2005; Miles et al., 2000; Tencati and Zsolnai, 2009). Companies can achieve competitive advantage by joining resources and accomplish more at a faster rate than they can on their own (Bøllingtoft et al., 2012; Daft et al., 2010; Miles et al., 2005; Schilling, 2010; Snow et al., 2011).

Collaboration among SMEs can be an advantageous strategy to overcome financial and resource limitations and strengthen their market position (Franco, 2003). Small companies are particularly motivated by competitive advantages, which include entering new markets; improving the level of innovation; sharing resources and competencies; achieving economies of scale; and increasing production capacity (Franco, 2003).

Firms within a cluster that face challenges and limitations, such as those of the Greenlandic business community, can achieve more through the act of collaboration than with own efforts within a cluster. Hence, there is a linkage between cluster development and collaboration, where clusters evolve and transition into collaborative communities for the reason that it will enable member firms to accomplish more business development. The transition from a cluster to a collaborative community is important as it represents an approach for continuous development and evolvement of clusters both from a theoretical and practical perspective. This is particularly interesting for small clusters such as ACRM. Collaborative community development is not always a result of an evolutionary process, but can also be a planned and purposeful process (Bøllingtoft et al., 2012). Therefore, the transition from a cluster to a collaborative community can also be a deliberate effort. For this reason, managing the transition process emphasizes the facilitating role of a shared service provider as this role is required in a collaborative community (Bøllingtoft et al., 2012). Adding to this, it is important to take account of the proximity dimensions in the transition process, as they are mechanisms that influence linkages between firms (Boschma, 2005).

In this paper, I develop a conceptual model for the transition from an economic cluster to a collaborative community, which is based on the core architectural elements of a collaborative community design and considers the proximity dimensions both as enablers and barriers to the transition process and collaboration.

The remainder of the paper is organized as follows. First, I provide the theoretical proposition of cluster development and collaborative communities. Then, I present the methodological approach. Thereafter, I investigate expectations and challenges associated with the mining industry in Greenland, which provides a contextual framework and thorough understanding of the subject to support further analysis. This is followed by the analysis, where I analyze cluster development and ACRM, and the collaborative approach to enhance local business development in Greenland. The analysis leads to a transition from ACRM as a cluster into a collaborative community relevant to extractive industries in Greenland. Here, I develop and outline the conceptual model for the transition from an economic cluster to a collaborative community. Lastly, I provide the discussion and a conclusion.

### **Cluster development**

Grouping of related suppliers of services, inputs, products, equipment, expertise, and know-how leads to the formation of a cluster (Ketels, 2003; Porter, 1998; Singh and Evans, 2009). Clusters arise when business segments require specialization from multiple contributors. And these formations emerge unexpected places both in advanced countries and in developing countries (Ghadar et al., 2012; Mathews, 2012). For example, several countries have used natural resources (mineral and hydrocarbon resources) as a platform to catalyze economic potential by developing clusters of supporting industries, products, and services, such as the cluster around extraction and

processing of copper ore in Chile and the Ontario Mineral Industry Cluster in Canada (Singh and Evans, 2009).

Clusters can increase competitiveness and drive innovation by their geographic concentration when bringing partners together and providing opportunities to share expertise and network (Porter, 2000; Singh and Evans, 2009). Clusters enable member firms to operate with a higher level of efficiency by sharing common technologies and infrastructure, and by accessing extensive information on market, technical and competitive matters (Delgado et al., 2014a; Ketels, 2003; Porter, 1998). Close interaction among firms leads to knowledge spillover, which creates new ideas, facilitates growth in entrepreneurship, and enables firms and research institutions to achieve higher levels of innovation (Delgado et al., 2010; Ketels, 2003). A high concentration of people who are working on similar problems in the same location can speed the progress, as collaboration that produces innovation is easier on the ground than in the cloud (Ghadar et al., 2012). Besides providing opportunities for innovation, clusters also provide the flexibility and capacity to act rapidly (Porter, 1998). Industries located in a strong cluster produce higher employment and patenting growth, which contributes to regional industrial growth (Delgado et al., 2014b).

#### **Government support**

While it is difficult to establish how clusters emerge, it is evident that government support is an important factor for cluster formation (Ghadar et al., 2012). Policy choices, public and private awareness, and investments can have a great influence in the process (Porter et al., 2004; Ghadar et al., 2012). Encouraged and aligned efforts by the private sector, government at all levels, and other institutions constitute an essential element in regional economic development. This is an evolutionary process combined with careful planning and investment to seize presented opportunities (Porter et al., 2004). Effort made by government or public institutions, including public spending for educational programs of local workforce or specialized infrastructure, has the ability to enhance productivity of local companies (Porter, 1998; Ghadar et al., 2012). Governments should reinforce and build on emerging and established clusters, and motivate and facilitate cluster development and collective action by the private sector (Porter, 2000).

#### **Inter-firm linkages in clusters and the proximity dimensions**

Clusters provide a platform to bring government, local institutions, and companies together in a constructive dialog for collaboration as a new way of organizing economic development beyond traditional efforts and to enhance the overall business environment (Porter, 2000). Interaction among cluster members, the strength of networks, and open collaboration within a region are key factors for economic success (Ketels, 2003).

Inter-organizational relationships, collaboration, in clusters depend on five proximity dimension: cognitive, social, institutional, organizational, and geographical (Belso-Martinez, 2016; Molina-Morales et al., 2015; Boschma, 2005). Studies provide evidence of proximities' influence on the formation of inter-firm linkages in clusters (Belso-Martinez, 2016; Molina-Morales et al., 2015). They are context specific and depend on the stage of the life-cycle of the cluster (Belso-Martinez, 2016). The cognitive proximity dimension refers to the similarity of actors' shared knowledge base, which eases collaboration. Common

interpretive schemes are needed in order to understand each other, communicate meaningfully, and generate knowledge (Boschma, 2005). Limited cognitive proximity can lead to misunderstandings and impede performance, whereas too close cognitive proximity may reduce inter-firm knowledge exchange and learning opportunities (Belso-Martinez, 2016; Molina-Morales et al., 2015).

The social proximity dimension refers to socially embedded relationships between actors at the micro-level and such behaviors include friendship, kinship, and experiences (Boschma, 2005). Social links create trust and reduce the risk of opportunism. Trust emerges from frequent meetings and face-to-face interactions, which leads to cooperative behavior. This is linked to geographical proximity (Molina-Morales et al., 2015). However, a high level of social proximity may underestimate opportunistic behavior (Boschma, 2005). The institutional proximity dimension refers to formal rules, codes of conduct, norms, and conventions that provide stability and basic level of trust. High levels of institutional proximity can prevent knowledge transfer, awareness of new innovation, and provide no opportunities for newcomers (Boschma, 2005; Belso-Martinez, 2016; Molina-Morales et al., 2015). Organizational proximity refers to share of relations in an organizational arrangement, where more control and possibilities to regulate interactions leads to greater organizational proximity, which reduces uncertainty and opportunism (Boschma, 2005). However, too much organizational proximity can lead to lack of flexibility (Belso-Martinez, 2016; Molina-Morales et al., 2015). Geographical proximity refers to the physical closeness. Geographical proximity strengthens indirectly other forms of proximity, such as the formation of institutions, embeddedness, trust, and cognitive closeness (Belso-Martinez, 2016; Molina-Morales et al., 2015). Proximity dimension interrelate and affect network dynamics, where two or more forms of proximity can complement each other (Boschma, 2005; Molina-Morales et al., 2015).

### **Collaborative communities**

The complexity and instability of the environment, and companies' weaknesses can push toward interorganizational relationships (Daft et al., 2010). Companies are changing the concept of what constitutes an organization by becoming involved in partnerships, breaking down boundaries, approaching with fairness, and adding value to both sides (Daft et al., 2010; Snow et al., 2009). The collaborative community design provides member firms the opportunity to mutually develop capabilities and increase effectiveness, efficiency, and productivity by mobilizing a wide variety of resources (Snow et al., 2011). Collaboration can reduce cost and risk, enhance flexibility, speed products to market, provide accessibility to new markets, and gain economies of scale without the fear of exploitation (Bøllingtoft et al., 2012; Fjeldstad et al., 2012; Schilling, 2010; Snow et al., 2011). Expanded availability and application of resources and knowledge can enhance innovation and wealth creation (Fjeldstad et al., 2012; Ketchen et al., 2007; Miles et al., 2000; Schilling, 2010). Effective collaboration is present when the involved parties value the contribution of each other and are concerned with equitable treatment (Miles et al., 2006). The underlying motives and beliefs of interacting parties point toward commitment to contributing to a shared set of goals and as well as achieving private benefits, which reduces the need for continuous assessment of trust (Adler et al. 2008; Miles et al., 2005; von Hippel and von Krogh, 2003). It is a behavior that can be learned (Miles et al., 2005).

### **The architecture of collaborative community design**

The architectural elements and core ingredients of a collaborative community design include actors, protocols and infrastructure, and commons (Fjeldstad et al., 2012; Miles et al., 2010). Actors are individuals, firms, or governments, who have collaborative capabilities, knowledge, information, tools, and values. Protocols are codes of conduct used by actors in their collaborative activities, which deals with the division of labor, linking, and mobilization of actors for a specific project or task (Fjeldstad et al., 2012). Infrastructure allows actors to connect to each other and access the same knowledge, information, and resources (Fjeldstad et al., 2012). Protocols set the directions for their collaborative activities, whereas shared infrastructure enables members to connect with each other and access the same information. Commons are a repository of resources and knowledge, which are available to all actors (Fjeldstad et al., 2012; Miles et al., 2010). Actors can collaborate to find solutions to problems and pursuit opportunities through shared access to commons supported by protocols and infrastructure that facilitate the collaborative process (Miles et al., 2010).

Time, trust, and territory are three essential conditions for establishment of an effective collaboration process. All three are broad and interrelated (Miles et al., 2000). Investing time is a basic necessity of engaging in a collaboration process, which is important for development of trust among the involved parties (Miles et al., 2000). Trusting relationships create an environment where involved parties are more willing to expose views and ideas without the fear of being exploited (Miles et al., 2000). The concept territory refers to a sense of belonging and it implies real evidence, such as stock ownership and one's efforts by which the outcomes of the collaborative process are achieved (Miles et al., 2000).

### **Governance structure**

A collaborative community is managed by a philosophy of minimal organization, such as the use of protocols and self-management instead of hierarchical controls (Adler et al. 2008; Miles et al., 2005). Effective governance of a collaborative community design requires a facilitative management approach and flexible governance structure, which carries no connotation of hierarchy or ownership and allows the community to expand and accelerate (Bøllingtoft et al., 2012; Miles et al., 2005; Miles et al., 2010; Snow et al., 2009). There is a need for a shared service provider in every collaborative community (Bøllingtoft et al., 2012). Activities performed by a shared service provider include screening and selection of member firms, linking members, development of a knowledge commons, infrastructure and protocols that connect members, administrative services, and strategic initiatives to improve and expand the community (Bøllingtoft et al., 2012; Miles et al., 2005; Snow et al., 2011).

### **Challenges**

The challenges associated with a collaborative design include ensuring commitment and necessary investments to the common goal, coordinating efforts of different contributors, and ensuring compatible solutions that fit together in the larger system (Miles et al., 2005; Miles et al., 2010; Miles et al., 2000; Schilling, 2010; Snow, 2012). Furthermore, collaboration faces barriers such as fear of exploitation, view that

collaboration is too time-consuming, costs exceeding benefits, and reduction of own talent pool and capabilities (Schilling, 2010; Snow, 2012). Collaborating partners must have compatible objectives, whereas contradicting objectives can result in conflicts, wasted resources, and lost opportunities (Schilling, 2010). Collaboration is fundamentally a voluntary and self-managed process, which can only be facilitated and encouraged and cannot be imposed, manipulated, or closely controlled (Miles et al., 2006; Miles et al., 2000).

## **Method**

The paper applies a single-case study design (Yin, 2014) and investigates opportunities and implications of the mining industry to the Greenlandic society and approaches to enhance local business development derived from the mining industry based on qualitative data (Creswell, 2009). The theoretical proposition guides data collection and analysis (Yin, 2014). The case study is based on data from interviews and is supported with data from documents, reports, research, and statistical sources, as multiple types of data increase the robustness of results through triangulation (Bryman and Bell 2007; Yin, 2014).

The key informants relevant to the subject of inquiry include the Government of Greenland, Ministry of Industry, Labour and Trade; Greenland Business Association; Confederation of Danish Industry; Arctic Cluster of Raw Materials; and a local Greenlandic business with experience in the mining industry and member of ACRM. They represent the local community content, authorities, and the local business community. The interviews with the selected key informants within these organizations are characterized as elite interviews (Kvale and Brinkmann, 2009) as these persons are leaders or experts in their field. These key informants contribute by their comprehensive experience and knowledge relevant to the societal aspects of mining in Greenland and business community perspectives. Hence, persons with these characteristics are few in numbers. Six semi-structured interviews are conducted with six key informants, whereof two key informants are from the Government of Greenland, Ministry of Industry, Labour and Trade (Gov GL), one key informant from Greenland Business Association (GA); one key informant from a local Greenlandic business (GL Bus); and two key informants from Arctic Cluster of Raw Materials and Confederation of Danish Industry (ACRM, DI). Arctic Cluster of Raw Materials is embedded within Confederation of Danish Industry and therefore the key informants cover both institutions.

The process follows seven stages of an interview inquiry (Kvale and Brinkmann, 2009): thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting. The study includes three topics: Greenland and the mining industry, cluster development, and a collaborative approach. The initial introductory topic provides a framework and an understanding of the context, which supports the analysis of the two following topics that are based on the theoretical propositions.

Five key informants were contacted by e-mail with an introduction to the research project, a short outline of the three topics, and a request for interview. The key informant from GA recommended the local Greenlandic business and its CEO as a key informant due to the company's experience with the mining industry and collaborative activities. The key informant from the local Greenlandic business was subsequently contacted by e-mail with an introduction to the research project and a request for

interview. An interview guide was prepared based on the three topics. The interview form of each interview is selected based on the preference of the key informant. Key informants located in Denmark chose between face-to-face, telephone, and Skype interviews. Key informants located in Greenland chose between telephone and Skype interviews due to the geographical distance from the researcher (Creswell, 2009). Four telephone interviews, one Skype interview, and one face-to-face interview were conducted. All interviews were recorded and transcribed with the interviewee's consent. The coding process of transcripts is based on meaning condensation (Kvale and Brinkmann, 2009) where statements are compressed into briefer statements and rephrased into few words and empirical themes are identified. The analysis is conducted by applying a theoretical lens (Kvale and Brinkmann, 2009; Yin, 2014) according to the theoretical propositions.

**Ethics:** All key informants are aware of that they are participating and contributing with their knowledge and perspectives to a research project and all remain anonymized.

### **Greenland and the mining industry: current situation, expectations, and challenges**

Greenland's economy is dominated by a large public sector, dependence on fishery (which accounts for 90% of total exports), a block grant of 3679 DKK million in subsidies from Denmark, and a negative growth rate (Statistics Greenland, 2016a). Greenland's current economic situation is considered vulnerable, with few sources of income and an increasing gap between expenditure and revenue. *"The economic situation is such, if you do not take any action, remain status quo, which is also a choice, then you simply aggravate the situation"* (key informant 1 Gov GL). There is a general awareness in Greenland about the necessity of economic diversification and business development according to key informants.

#### **Expectations**

Extraction of natural resources is considered as an industry that will make a difference to the society and provide economic prosperity (Copenhagen Economics, 2012; Government of Greenland, 2014; Ministry of Foreign Affairs, 2011; Nuttall, 2012; The committee for Greenlandic mineral resources to the benefit of society, 2014; Økonomisk Råd, 2012). *"The industry that can really make a difference and create an economic base and liberate Greenland's dependence on the two sectors (fishery and block grant) is natural resources"* (key informant 2 Gov GL). The extractive industry is stated from the political system and the business community as a pillar that can and should be developed in order to boost the economy (Bjørst, 2016; Government of Greenland, 2014; Tiainen; 2016). *"... it (mining industry) will contribute to the society by generating jobs, turnover, tax revenue, and that way it will generate growth for companies and the society as a whole"* (key informant 2 ACRM, DI). Additionally, *"... mining industry can be a catalyst to raise the educational level in Greenland"* (key informant GA).

Communities in other parts of the Arctic have realized socioeconomic development from the presence of the mining industry (Frederiksen and Kadenic, 2016; Kadenic, 2015; Missens et al., 2007; Prno, 2013; Ritter, 2001). *"... it (mining industry) especially creates jobs in the derived effects. Such as service tasks, mechanics, catering, transportation, logistics. And I believe that this is where the Greenlandic companies have potential"* (key

informant GA). Linkages between the mining industry and other sectors include supply of food and catering services, transportation services, construction, utilities, and materials (Aroca, 2001; Ejdemo, 2013; Hajkowicz et al., 2011). The derived business opportunities deserve particular attention, since this is where the Greenlandic businesses will find a strong fit between local capabilities and the demand side of mining.

### External challenges

Undoubtedly, there are great expectations that the mining industry will be beneficial to the Greenlandic society. Nevertheless, there are some challenges that can impede the establishment of a mining industry in Greenland. Among the external challenges, since 2014, prices for commodities such as crude oil (Nasdaq, 2016) and iron (Infomine, 2016) have fallen, reducing the business case for developing mines in Greenland at present time. *"...the problem is that the prices are not at their peak at the moment. And then they (mining companies) do not have a business case"* (key informant 2 ACRM, DI). A promising large-scale project in West Greenland, the Isua iron ore mine, is currently on hold as the company (London Mining Plc) behind the project was faced with financial problems, and the exploitation license has been transferred to the Hong Kong-based company General Nice Development Limited (Government of Greenland, 2015). Furthermore, Maersk Oil has postponed exploration activities in Baffin Bay due to low oil prices (Borsen, 2016).

Key informants elaborate that lack of funding also impedes development of a mining industry. Currently, there are no significant Greenlandic or Danish investments in Greenlandic mining projects. *"You not only need risky money, but plenty of really risky money to push some projects in progress"* (key informant GL Bus). Investing in the mining industry is associated with great risk, which typically does not appeal to public funding or pension funds, as these particular investors seek secure and long-term investments with reasonably guaranteed returns. *"... if they (local investors) do not invest in their own country, then the risk might be too high and therefore foreign investors are maybe holding back"* (key informant 1 ACRM, DI). However, key informants stress that there is a need for public Greenlandic and Danish funding to show commitment to the local mining industry and potentially attract private and foreign investments. These investments may not directly be in mining projects, but investments in local infrastructure and hydropower could strengthen the business case for investing in mining projects.

### Internal challenges

Among the internal challenges, resource extraction in Greenland, as in other parts of the Arctic, is challenged by the climate conditions, limited infrastructure, and remoteness (Hansen et al., 2016). Furthermore, primary school is the highest level of education for 63 percent of the Greenlandic population (Statistics Greenland, 2014). *"...we are also challenged on the skills of the workforce in Greenland, there is a gap between the needs, the technically advanced issues, and the competencies that are present"* (key informant 2 Gov GL). Besides uncertainties regarding necessary competencies, Greenland has a small labor force of 26,764 (Statistics Greenland, 2016a). As an example, the proposed large-scale mining project, Isua, requires a workforce of between 1,500 and 2,000 employees with a peak of up to 3,300 employees during a three-year construction phase (SIA of the Isua Iron Ore Project, 2013). This need cannot be met entirely by the local workforce. *"We*

*cannot deliver full labor force for the construction of large mining projects. Small projects are no problem*" (key informant 2 Gov GL). Adding to this, the business community is dominated by SMEs (small medium-sized enterprises), where 75.1 percent of companies in Greenland are proprietorships (Statistics Greenland, 2016b). *"90 percent of businesses have fewer than 10 employees. So if you want to make yourself relevant in a larger context, then it (collaboration) is the way forward"* (key informant 2 ACRM, DI). Hence, collaboration appears to be a suitable strategy to pursue in order to strengthen local competitiveness and enhance local business development in the mining industry.

## **Analysis**

This section presents key findings of the empirical work analyzed according to the theoretical perspectives. Further, the analysis directs toward a transition from ACRM as a cluster to a collaborative community.

### **Cluster development and Arctic Cluster of Raw Materials**

ACRM represents 27 businesses ranging broadly from transportation and logistics companies to law firms and consultancies, which covers the entire life cycle of a mining project (Arctic Cluster of Raw Materials, 2016). Cutting across traditional industry classifications and including a variety of industries and companies is a key feature of cluster formation (Porter, 1998, 2000; Porter et al., 2004; Singh and Evans, 2009). Clusters allow members to access extensive market information (Delgado et al., 2014a; Ketels, 2003; Porter, 1998), which is also a key contribution of ACRM to its members. *"We collect knowledge within our platform and disseminate knowledge to members by hosting various seminars, going on field trips to see how we can do it better, schedule meetings with companies from other mining countries such as Canada to hear more about their experiences, something we can learn by and also learn from each other"* (key informant 2 ACRM, DI). Key informants emphasize networking as a key benefit of being a member of ACRM. The opportunity to communicate and become familiar with other companies is highly valued by the members. In addition to knowledge sharing and networking, ACRM constitutes as a marketing platform for members. *"I believe that many companies need to have some kind of platform to promote them. Both promote Greenland as an investment object and themselves as a part of the industry"* (key informant 1 ACRM, DI).

### **Subcontractor barrier**

It is very challenging to make yourself visible as a single Greenlandic company in a highly competitive mining industry without any prior experience as a subcontractor. Mining companies have typically established a network of subcontractors with proven track records, necessary certifications, and quality levels to work in the Arctic or the mining industry in general. Therefore, mining companies will primarily assign known subcontractors within their own network. *"There is a barrier in relation to not being inside or a known subcontractor, or how to qualify to get on the list of potential subcontractors"* (key informant 1 ACRM, DI). It is also difficult for Greenlandic SMEs to arrange a meeting with a mining company and get recognized as a potential subcontractor. In this regard, a cluster becomes valuable, as the whole is greater than each single company that comprises the cluster (Porter, 1998, 2000). ACRM address this problem by gathering members and arranging meetings with mining companies. This way, a group of potential subcontractors

are represented in one place and the mining company becomes aware of them and their services. *"... and the client (mining company) tells that it is interesting for us (mining company) to meet all of them (potential subcontractors, members of ACRM) at once and know that there is an entrance door to subcontractors in Greenland, they (mining company) can find it here (ACRM)"* (key informant 1 ACRM, DI). Hence, ACRM takes on the facilitating role when it comes to establishing relations between its members and mining companies. According to key informants, size matters in order to become subcontractor to mining projects. Large mining companies are more likely to make a contract with one large subcontractor, who guarantees the delivery of large construction work rather than hiring several smaller subcontractors to do the same work.

### ***A timing dilemma***

Governments have the ability to support and motivate cluster development by initiating educational programs to enhance the productivity of local workforce and local companies (Porter, 1998, 2000; Porter et al., 2004). The Government of Greenland has financed a competency development program to improve qualifications of local workforce and local companies to prepare local companies for being positioned as service providers in the mining industry. Aligned efforts by the Government of Greenland indirectly support the purpose of ACRM, as they both aspire to strengthen the competitiveness of local businesses in a mining context. *"The past year has been characterized by companies in Greenland being reluctant towards the mining industry, not because they have anything against it, but because it has not turned into something big yet"* (key informant 2 Gov GL). Key informants stress that the downturn in the mining industry combined with lack of local project development at present time causes reluctance among local businesses to allocate resources from daily operations to participate in competency development programs. *"But it is very hard constantly to wait and get trained for something you do not know will be realized"* (key informant 1 ACRM, DI). This leads to uncertainty about when to improve qualifications of local workforce. Undoubtedly, preparing the local workforce and businesses for the next upswing will be advantageous. Nevertheless, local businesses are occupied by their daily operations and qualifying for an industry that is not fully established is difficult to prioritize. In this regard, it is worth drawing on perspectives from other mining projects in the Arctic. In the cases of Red Dog Mine in Alaska and Diavik Diamond Mine in Canada, education and training of local workforce is undertaken cooperatively by the mining company and the local community and is continuously provided throughout the construction and operation phases (Ednie, 2002; Kadenic, 2015; Missens et al., 2007). In both cases, agreements were made during the planning phase of the project life-cycle. This clearly shows that training and improvement of qualifications should not necessarily all take place in advance, but it is possible to reach a solution where the local community and the mining company jointly provide education and training programs for the local workforce.

Some key informants emphasize that collaborative agreements should be in place prior to a future upswing in the mining industry. *"And for the members that we have in the cluster (ACRM), when an upswing comes in the mining industry, you have to be ready, and you must have your strategic collaboration agreements in place..."* (key informant GA). Ultimately, collaborations should be established prior to development of large mining projects, otherwise it may be too late (Jakobsen and Lyne, 2014).

### **Toward collaboration**

The Greenlandic businesses community can overcome prevailing challenges by engaging in collaboration, as collaboration enables SMEs to gain economies of scale (Franco, 2003), mobilize a variety of resources (Snow et al., 2011), achieve competitive advantage, and access new markets (Bøllingtoft et al., 2012; Fjeldstad et al., 2012). *“You need to engage in collaborations with the awareness about that we cannot do this alone, but we can do this together”* (key informant 2 ACRM, DI). Instability of the environment, companies’ weaknesses (Daft et al., 2010) and competitive pressure (Fjeldstad et al., 2012) push toward a collaborative design (Bøllingtoft et al., 2012; Miles et al., 2010; Snow, 2012; Snow et al., 2011; Snow et al., 2009). *“...If we want the large contracts that cover many things, which makes it easier for the licensee to have fewer contracts to monitor, then we need to obtain skills that are not our core competencies, but which are necessary to have when bidding for a contract. That is why we are seeking partnerships”* (key informant GL Bus). The motivation to engage in collaboration arises from a necessity based on realization of firm’s internal weaknesses and the external pressures in order to continuously adapt to the business environment.

### **Exploitative collaborations, a competitive environment, and the importance of trust**

The key of successful collaboration is based on achieving mutual benefits (Miles et al., 2005; Miles et al., 2000), fairness (Snow et al., 2009), and breaking down boundaries. However, this is not always a part of the collaborating experience from the Greenlandic business community’s perspective. Attempts to engage in partnerships often end up as a one-way benefit for Danish or foreign companies. *“I can say from my own experience that we often run into Danish and foreign companies that need Greenlandic companies, they do not want a real collaboration, they just need to have the collaborative agreement on paper”* (key informant GA). These collaborations are characterized as big-brother/little-brother relations with a lack of reciprocity and mutual benefits. Danish and foreign companies need collaborative agreements with Greenlandic companies to be considered within the local content quota in Impact Benefits Agreements (IBAs). Fear of exploitation (Snow, 2012) and contradicting objectives (Miles et al., 2010) are substantial challenges to a productive and effective collaborative design, which unfortunately is a part of the Greenlandic businesses’ experience with collaboration. The Greenlandic businesses are not interested in engaging in exploitative collaborations; they want genuine collaborations where both parts contribute and operate under equal conditions. It is necessary to overcome these fundamental barriers by coordinating efforts and ensuring commitment to a mutual goal (Miles et al., 2010) and thereby creating transparency and synergy in collaborations.

The Greenlandic businesses are met with competition among themselves in a small community and a small market regardless of the extractive industries. In a small Greenlandic market, where everyone knows each other, businesses are constantly faced with their competitors as they are bidding for the same work and contracts. *“It is also difficult if you have five companies in a small community that have been in fierce competition with each other in the last 20–30 years and suddenly must look beyond these small local interests (...) so you have to look beyond some of these things and understand that these things are so large (mining industry) that you need to collaborate, otherwise they (local businesses) might end up standing as spectators”* (key informant GA).

Commitment and contribution to shared goals among collaborating parties reduces the continuous need for assessment of trust (Adler et al. 2008; Miles et al., 2005; von

Hippel and von Krogh, 2003). Lack of those combined with years of competitive circumstances leaves a sense of skepticism and distrust among the Greenlandic business community. Trust, along with time and territory, are essential for establishment of a collaboration process (Miles et al., 2000). Trust is paramount for successful collaboration from a Greenlandic business perspective. *“If they try to go around us, then we cannot work with them, even when times are better. Once you have broken the trust, you are not getting back inside”* (key informant GL Bus). It takes time (Miles et al., 2000) to establish trusting relations, which requires that involved parties—Greenlandic, Danish, or foreign—take time away from their daily operations and invest time and commit to the collaboration, which eventually reduces the fear of exploitation.

Besides allocating time to the collaboration, establishment of trust needs attention, since it is perceived as an essential part of the collaborative process by the Greenlandic business community. Hence, the application of protocols becomes a valuable instrument when engaging in collaboration. By applying protocols, the Greenlandic businesses who engage in collaboration can secure the direction for the activities, mobilization, and linking of labor (Fjeldstad et al., 2012). *“You have to open up if you want a partnership, then you have to be able to trust each other (...) our business, the whole design, the set-up, they (collaborating parties) are a part of it. So if they are going to be a part of it, then they have to commit to us”* (key informant GL Bus). It is a way to ensure commitment toward a common goal and support the establishment of trust, when the foundation for collaboration is written in place. Protocols should be regarded as a step toward overcoming the big-brother/little-brother disputes, getting beyond local rivalry, and achieving genuine collaborations under equal conditions and ownership.

#### **Transition from a cluster to a collaborative community**

The arguments to engage in collaboration seem inevitable for the Greenlandic business community, as collaborative arrangements are an attempt to overcome liability of smallness and increase commercialization (Bøllingtoft et al., 2012). As clusters are geographic concentrations of companies in a particular field (Porter, 2000), companies within a cluster should be regarded as potential collaborators. Members of ACRM are businesses that share a common objective to accelerate in the mining industry, and in order to do so, collaborative arrangements are advantageous. Potential collaborators in this context are already interconnected through ACRM. Hence, the linkage between cluster and collaborative community development becomes apparent in order to overcome prevailing limitations and increase business potential by pursuing a collaborative approach.

#### ***Managing the transition***

To manage the transition from a cluster to a collaborative community requires particular emphasis on the facilitating role. Bøllingtoft et al. (2012) argue the role of a shared service provider is crucial for the development of a collaborative community. In a study of three different collaborative communities—Blade.org, Kalundborg Industrial Symbiosis, and MG50 Bøllingtoft et al. (2012) emphasize the necessity and importance of a shared service provider in each collaborative community to provide services that enable members to self-organize and collaborate.

Following activities are identified that are performed by a shared service provider according to Bøllingtoft et al. (2012), p 103: “(a) screening and/or selection of member firms, (b) provision of infrastructure and protocols for members to connect with one another, (c) development of a knowledge commons, (d) administrative services, and (e) strategic initiatives to help the community to expand and improve.” The activities performed by a shared service provider vary according to the purpose and needs of each community. For example, Snow et al. (2009) also describe Blade.org, a collaborative community that consists of complementor firms (Fjeldstad et al., 2012) that together represent different capabilities. The design of Blade.org includes a “principal office,” which provides administrative services, infrastructure, and strategic initiatives to operate and expand the community.

As a cluster is comprised of potential collaborators, the following step to manage the transition from a cluster into a collaborative community is identification of a shared service provider to perform activities that will enable cluster members to collaborate. In the case of ACRM, a “principal office” organizes various events provided to members. In this sense, the “principal office” of ACRM has the ability to undertake the facilitating role in a collaborative community. ACRM carries no connotation of ownership, which fits with the facilitative management approach (Miles et al., 2005). Among the identified activities by Bøllingtoft et al. (2012), ACRM already conducts strategic initiatives by providing a promotion platform for members and establishing relations between mining companies and members. Getting recognized with own efforts as a Greenlandic SME in the mining industry is considered very difficult, whereas being represented alongside other SMEs across industries displays professionalism.

ACRM in its current form does not perform the remaining activities of a shared service provider. Hence, in order to transition into a collaborative community, it is necessary to develop and provide suitable infrastructure, protocols, and knowledge commons tailored to fit the needs of the collaborative community in order to support collaborative relationships among members (Bøllingtoft et al., 2012; Miles et al., 2005; Snow et al. 2011). Current activities conducted by ACRM, such as continuous collection and dissemination of knowledge through seminars and field trips, and the accessibility of a cluster website, should be regarded as valuable components. These can be further developed as activities performed by the shared service provider in the transition process to a collaborative community. ACRM does not provide administrative services, help firms directly to collaborate, or screen and select firms to collaborate, which a shared service provider should do according to Bøllingtoft et al. (2012), Miles et al. (2005), and Snow et al. (2011). Furthermore, according to Snow et al. (2009), design features such as criteria for selecting the “right” member firms, IT infrastructure, and all-member meetings facilitate trust building. Hence, ACRM, as a shared service provider in a collaborative community, should be more selective when allowing new members in the collaborative community to secure the right fit. As a shared service provider in a collaborative community, ACRM needs to ensure commitment to common goals, secure direction for collaborative activities, and support the building of trust among collaborative actors.

Proximity dimensions are considered as mechanisms that can bring actors together (Boschma, 2005), which must be taken into account in the transition process. Too little and too much proximity may be harmful for effective inter-organizational linkages (Boschma, 2005; Molina-Morales et al., 2015; Belso-Martinez, 2016). Hence, these

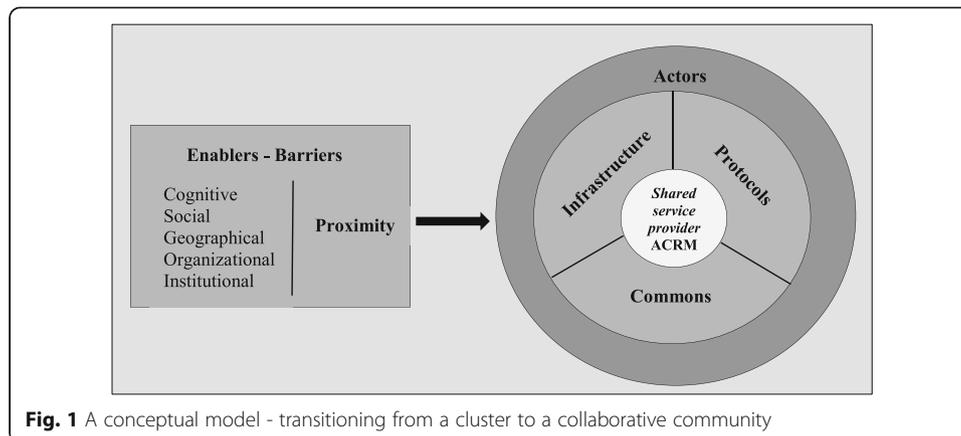
proximity dimensions are both enablers and barriers to collaboration. Therefore, it is important to consider the proximity dimensions in the transition process and in the activities assigned to a shared service provider.

Cognitive proximity in terms of a shared knowledge base is necessary for actors in order to communicate, understand, and process new information (Boschma, 2005). ACRM consists of a broad range of businesses from consultancies to transportation firms; therefore the cognitive proximity is not considered high, which may be an initial barrier. Hence, providing *knowledge commons*, as a key activity of ACRM as shared service provider, is important in order to sustain a close cognitive proximity in the collaborative community. Nonetheless, common and complementary capabilities among actors, a combination of cognitive distance and similar capabilities is advantageous for innovation (Boschma, 2005). While cognitive proximity is prerequisite for learning, the other four dimensions are mechanisms that can bring actors together (Boschma, 2005).

Social and geographical proximity enhance linkages and are important door openers to new linkages, as they foster a trustful atmosphere and facilitate interactions among local actors (Belso-Martinez, 2016). The social and geographical proximities are high in the Greenlandic business community, and therefore are regarded as important enablers in collaborations and in the transition process. However, these proximities may be lower regarding Greenlandic and Danish inter-firm relationships, which may explain previous negative collaboration experiences. High institutional proximity negatively affects the formation of linkages in advanced stages of the cluster life-cycle (Molina-Morales et al. 2015). However, ACRM is still in its early stages of a cluster life-cycle, therefore the institutional proximity is regarded low. Too little institutional proximity is harmful to collective actions due to a lack of common values and weak formal institutions (Boschma, 2005). According to Boschma (2005) Institutional proximity is an enabling factor, as it provides stable conditions. To this extent, it is important to emphasize *protocols* of the collaborative community design in the transition process as a key activity of ACRM as a shared service provider in order to reinforce the institutional proximity and reduce opportunistic behavior. Organizational proximity is not characterized as high due to a lack of actual collaboration. However, both social and organizational proximities as characterized by strong ties between actors, therefore organizational proximity may eventually increase over time.

The *infrastructure* of the collaborative community becomes an important element and activity of ACRM as shared service provider in the transition process. Infrastructure facilitates communication between actors and access to the same knowledge commons (Fjeldstad et al., 2012), which supports the social, geographical, and cognitive proximities.

Figure 1 illustrates the conceptual model for managing the transition process from a cluster to collaborative community. The five proximity dimensions as mechanisms that influence the linkage between firms in clusters are both enablers and barriers to the transition process and collaboration. The core elements of the collaborative community (infrastructure, protocols, and commons) have the possibility to mediate the proximity dimensions, as they can be tailored to fit the needs of the collaborative community. The transition process emphasizes the role of a shared service provider. Of course, collaborating actors are required, which is included in the conceptual model.



To realize the transition to collaborative community for extractive industries relevant to Greenland requires great effort and commitment by ACRM in order to perform activities assigned to a shared service provider. Naturally, it also requires collaborating actors, current or new members of ACRM, who have collaborative capabilities (Fjeldstad et al. (2012) and voluntarily want to engage in a collaborative process (Miles et al., 2000).

#### **Motivation for transition**

Being a part of the cluster, a network of interconnected companies in the mining industry, will not solve the prevailing limitations of member firms. Evolving and managing the transition from a cluster into a collaborative community and adapting to the business environment, will create more value to members and fulfill the initial purpose for establishing ACRM. ACRM is not the result of an evolutionary process, but a purposeful attempt by funding institutions to gather a variety of businesses with the purpose to increase possibilities and competitiveness for subcontractors. Development of a collaborative community can also be a purposeful and planned process (Bøllingtoft et al., 2012). The transition to a collaborative community relevant to extractive industries in Greenland should be pursued as a deliberate effort by ACRM.

In transitioning from a cluster to a collaborative community, members of ACRM can achieve individual benefits (von Hippel and von Krogh, 2003) as well as shared goals (Miles et al., 2005) by pooling resources and knowledge and strengthen their position and competitiveness as subcontractors to mining projects. These benefits do not follow from being a concentration of interconnected businesses that comprise a cluster, but from transitioning into a collaborative community and pooling resources toward a common goal.

The process costs (Barnett and Carroll, 1995) associated with the changes and actions needed in order to transition from a cluster to a collaborative community are related to the necessary time and resources that need to be invested by the principal office of ACRM in order to undertake the facilitating role to manage the transition and perform activities of a shared service provider. Additionally, the transition process entails costs to member firms, as they too, must invest time and resources beside their daily operations to engage in the collaborative activities.

However, the content costs (Barnett and Carroll, 1995) associated with lack of change and remaining as a cluster entails only costs to members, as they continue to face the prevailing challenges and will not enhance their capabilities to be recognized and considered as potential subcontractors to mining projects. In this regard, ACRM carries no content

costs as it continues to operate within the same scope of work and with the same time and resources allocated to do so.

The linkage between cluster development, particularly small clusters, and collaboration is advantageous as it represents an approach for continuous development and evolution of clusters. This way, small clusters such as ACRM can become more powerful and enable members to realize business development that each single business could not manage with its own efforts in a cluster. Collaboration represents a new approach to organizing small businesses in remote regions, such as Greenland, in order to enhance their capabilities. Business environment in remote regions is typically weaker than in metropolitan regions due to lower population density, lack of quality of available workforce, and lower economic activity (Porter et al., 2004). These characteristics are not only evident for Greenland, but can be found throughout the entire Arctic (Duhaime, 2004; Duhaime and Caron, 2006; Huskey and Pelyasov, 2015). Hence, this represents a new way to think about industrial development and business development in remote regions throughout the Arctic.

## **Discussion**

The current circumstances in Greenland are not preferential. Economic vulnerability, the necessity of economic diversification, and abundance of natural resources leads to great expectations that extraction of natural resources will provide economic prosperity to the society (Bjørst, 2016; Tiainen, 2016). Unfortunately, falling commodity prices reduce the business case for establishing mines in Greenland and do not attract investments in any mining activities. This leaves Greenland in a sense of standstill. Nevertheless, the effect of these external challenges on Greenland is unavoidable, and to overcome this may require other initiatives or enormous investments to push projects in progress regardless of market conditions. However, a future upswing in the industry should indeed boost the business case to the benefit for Greenland.

A collaborative design is a strategy to overcome the prevailing limitations of the Greenlandic business community and potentially increase application of Greenlandic businesses in mining projects. The willingness and motivation to engage in collaborations arise from recognition of the necessity to adapt to the business environment (Daft et al., 2010). However, engaging in a collaborative process might not be straightforward for Greenlandic businesses when considering some of the previous experiences with foreign and Danish collaboration partners and the internal competition in their home market. These experiences and conditions foster skepticism and distrust, which is very destructive for a collaborative design as trust is an essential element for successful collaboration (Miles et al., 2000). Geographical proximity stimulates social proximity, because short distances favor social interaction and trust building. These are particularly an enabling factor in the transition process and collaboration. However, the isolation of the region may lead to excess of social and geographical proximities, which can have adverse impact on innovation and learning and lock actors into established ways of doing things.

To manage the transition from a small cluster to a collaborative community emphasizes the facilitating role of a shared service provider, which is required in every collaborative community (Bøllingtoft et al., 2012). The transition from ACRM as a cluster to ACRM as a collaborative community significantly expands the role of ACRM. ACRM already conducts strategic initiatives, but it needs to take on additional activities assigned to a shared service provider in a collaborative community (Bøllingtoft et al., 2012; Miles et al., 2005;

Snow et al., 2011; Snow et al., 2009), which supports a gradual development of trust. It is important to consider the proximity dimensions as they are mechanisms that influence linkages between actors. A key focus area in the transition process is the institutional proximity, which is considered low. High level of institutional proximity supports stability and a basic level of trust, which can be enhanced through the development of protocols. The potential collaborating actors can be found among the existing or new members, as they have an interest in working in the Greenlandic mining industry. Hence, it is advantageous to build on something already existing in order to pursue meaningful collaboration to enhance local business development derived from the mining industry. This may lead to innovation, entrepreneurship, or new collaborative start-ups in a future scenario (Franco, 2003). Nevertheless, this requires that ACRM continue to accelerate and retain its members throughout the current downturn in the industry and encourage and facilitate the collaborative process.

This provides a new perspective on cluster development, particularly small clusters, by suggesting that clusters can evolve from “just” being a concentration of interconnected companies by transitioning into collaborative communities and thus creating more value to members. Naturally, a transition process from a cluster to a collaborative community and the role of a shared service provider in the transition requires further research both in theory and practice. Moreover, this represents a new approach to accelerate business development in a business environment that faces limitations of smallness and inadequate resources, which is highly relevant in remote regions throughout the Arctic.

The case-study approach allows in-depth exploration (Creswell, 2009; Yin, 2014) in order to understand complex social phenomena and retain a holistic and real-world perspective (Yin, 2014), which is valuable in this context. The one-case selection in this study is a limitation to generalizability of the findings. Nonetheless, the intention of this study is not generalizability in the conventional sense, but rather the force of example (Flyvbjerg, 2006). The geographical isolation of Greenland may stimulate collaborative behavior not only due to a high geographical and social proximity, but also due to a lack of other options available in remote regions. What might appear as an advantageous strategy to pursue for Greenland may not necessarily apply to other Arctic communities dealing with extractive industries. Nonetheless, as experiences with extractive industries in other Arctic locations provide knowledge and perspectives to Greenland, studies of Greenland can contribute learnings to other Arctic communities. The analysis is based on insights and perspectives of the selected key informants, which are considered most relevant with respect to the topics of investigation in this study. Nevertheless, if key informants from other institutions were chosen for the study, they might shed light on other topics and issues.

Continuous debates on how the development of extractive industries can be managed to maximize socioeconomic benefits to the Greenlandic society is important, as the development of these will inevitably influence the society in the future (Hansen et al., 2016). This study contributes with detailed insights and perspectives to shape the discussions about Greenland as a future mining nation and how to maximize local socioeconomic value creation and business development.

## **Conclusion**

Natural resource extraction is considered a pathway to economic diversification and prosperity for the Greenlandic society. Nevertheless, Greenland’s business community is

challenged by size limitations, lack of necessary skills, and no extensive experience with the mining industry.

This paper examines the Greenlandic business community and the Arctic Cluster of Raw Materials, ACRM, to enhance local business development in mining projects in Greenland. However, a cluster of interconnected companies does not solve the prevailing limitations of the Greenlandic business community. Collaboration in this context is an approach to enhance capabilities and organize small businesses in remote regions. The analysis directs toward a transition from an economic cluster to a collaborative community. Hence, adapting to the business environment and managing the transition from ACRM as a cluster to a collaborative community enables member firms to realize business development that each single firm cannot achieve with own efforts. To manage the transition emphasizes the facilitating role, as every collaborative community requires a shared service provider. This expands the role of ACRM by undertaking the facilitating role and performing activities assigned to a shared service provider. In addition, it is necessary to consider the five proximity dimensions (cognitive, social, geographical, organizational, and institutional) as they are mechanisms that influence linkages between actors. This paper presents a conceptual model for the transition process to a collaborative community, which is based on the elements of the collaborative community design and considers the five proximity dimensions as both enablers and barriers to the transition process and collaboration. The transition should set the direction for the Greenlandic business community to engage in collaborations in order to overcome prevailing limitations and enhance local business development derived from the mining industry.

#### Competing interests

The author declares that they have no competing interests.

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