CLARITY:
A Call for Transparency in Marine Diamond Mining

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ABSTRACT

This capstone project tellS the untold story of marine diamond mining (MDM), tracing its origins from the shores of Namibia to the fjords of Greenland. Despite the stark differences between these two locales, they share striking similarities in diamond potential. In Namibia, MDM flourished prior to the country's independence and the establishment of international mining laws, setting a precedent for potential challenges in Greenland's current political landscape. Through in-depth research, stakeholder interviews, and media production, this project fosters an informed storyline for a full-length documentary film. The capstone deliverables encompass a film treatment, budget, film plan, concise trailer, and transcribed interviews, strategically crafted towards securing future support of the project. The outcome of such seeking to advocate for greater transparency in the diamond industry and policies that prioritize both economic development and environmental integrity. The final film will engage audiences worldwide in considering the implications of MDM for Greenland's evolving climate and economy.

BACKGROUND

While deep seabed mining has garnered international attention for several decades as policymakers strive to establish extraction regulations, another form of seafloor mining has quietly existed under the radar - marine diamond mining (MDM).

MDM IN NAMIBIA: HISTORY, TECHNOLOGY & ECOLOGICAL IMPACTS

MDM dates back to the early 20th century when diamond deposits were first discovered off the coast of Southern Namibia (then part of South Africa). However, it wasn't until the 1960s that concerted efforts were initiated to explore and exploit these underwater diamond resources. What began then with near-shore surveys and air-lift suction pumps, over time developed into a full-fledged operation accounting for most of the high-value and high-quality diamond supply in Namibia (Corbett, 1996; Schneider, 2020).

The largest MDM license area, the Atlantic 1 (MLA 47), is operated by Debmarine Namibia Pty. (DBMN), a joint venture between the De Beers Group and The Government of the Republic of Namibia (De Beers Group, 2022). Situated in the southeastern section of Namibia's Exclusive Economic Zone (EEZ), Atlantic 1 encompasses approximately 5,987 km^2 and features water depths ranging from 20 meters to 180 meters (Risk-Based Solutions (RBS), 2021). The Kaapvaal Craton, an ancient region over 2.5 billion years old, is the source of southern Africa's abundant diamond production. Geological changes, including river incisions due to uplift and glacial periods altering sea levels, led to the transportation and distribution of millions of carats of diamonds along the southern Atlantic coastline (Schneider, 2020).

Utilizing a fleet of seven mining vessels equipped with horizontal seabed crawlers and vertical drills, DBMN is capable of diamond extraction down 7m into seafloor sediments. Approximately sixty tons of sediment per ship are excavated from the seafloor per hour (Vella, 2018). Once aboard the ship, sediment is sorted into smaller and smaller particles using a series of automated vibrating sifting racks. Unwanted material is discarded overboard, while diamonds are mechanically sealed in barcoded containers without ever touching human hands. Diamond containers are then flown back to shore via helicopter for processing several times per week (Vella, 2018). Each production vessel is a self-contained unit, operating for 24 hours a day, twelve months a year, with crews operating in 28-day shifts and vessels dry-docking only once every third year (Risk-Based Solutions (RBS), 2021).

Known environmental impacts from MDM include direct harm/mortality to seafloor organisms, changes in substrate composition, loss of biodiversity, tailings disposal leading to the smothering of benthic communities, release of hydrogen sulfide in muds, and altering the chemical composition of the water column. Recovery times for impacted areas are expected to span decades (Risk-Based Solutions (RBS), 2021).

POLITICAL RELEVANCE

Atlantic 1 was defined and allocated while Namibia was under South African rule and was grandfathered in upon the country's attainment of independence in 1990 (Garnett, 2002). This is of significance because it allowed for the transfer of existing agreements regarding

mining procedures in Atlantic 1 long before the United Nations Convention on the Law of the Sea (UNCLOS) entered into force in 1994. The International Seabed Authority (ISA) was instated at this time and began drafting regulations regarding mineral mining of the international seafloor. These regulations are still in negotiations today (Pickens et al., 2024).

Consequently, Namibia was able to create the Diamond Act 1999, which notably set aside "diamonds" from "minerals" as defined by both UNCLOS and the ISA (*Diamond Act, 1999*, 2006). Although the Namibian Constitution's Article 144 automatically incorporates international law into domestic legislation, this legal definition has inadvertently created a gap in Namibia's required compliance with the standards set forth in UNCLOS Article 208, which stipulates that laws, regulations, and measures pertaining to mineral mining must match or surpass the effectiveness of international rules, standards, and recommended practices and procedures (Namibia, 1990; United Nations (U.N.), 1982). This in, in addition to the reality that MDM exists at the threshold of what is considered the "deep-sea," but never actually crossing into it, makes it unclear whether diamonds will require the same regulations as other seafloor minerals upon the finalization of the ISA's mining code.

POLAR POTENTIAL

The Atlantic 1 MLA lease term in Namibia ends in 2035 and DBMN's expected life of mine concludes in 2055 (Anglo American plc, 2021). In 2019 De Beers Marine (DBM) signed a five year prospecting license with the Government of Greenland, and in 2021, they contracted the Geological Survey of Denmark and Greenland (GEUS) to explore the seafloor for diamonds near the west-coast town of Maniitsoq (Gronholt-pedersen & Denina, 2021; Perkins, 2021). Recent studies suggest commercial viability for MDM in the Maniitsoq area, suggesting similarities to the geomorphology of Namibia's Kaapvaal craton. (Nielsen et al., 2006; Hutchison, 2023).

THE DESIRE FOR INDEPENDENCE

As a territory of the Kingdom of Denmark, Greenland's political debate centers around the choice between sovereignty and association. Each year Denmark subsidizes their economy with approximately DKK $3.9 billion. The 2009 Greenland Self-Government Act expanded the territory's power, giving more control to local authorities and sovereignty of all subsoil mineral resources from 2010 onwards (Perkins, 2021).

However, in order for independence to truly become a reality, Greenlanders will need to build a self-sustaining economy, raising doubts for mining as a viable solution and the urgency to develop it as an economic pillar (Hurwood, 2022). Additionally, there's general hesitation as to whether economic modernisation will negatively impact Inuit cultural heritage the the preservation of their fragile environment. Apart from the financial support from Denmark, Greenland primarily relies on its fishing industry, contributing up to 90% of exported goods and making up 12.6% of its GDP (Kleemann, 2022). The environmental impacts on the arctic ecosystem could lead to enduring repercussions for their primary source of income, particularly affecting the seafloor-dwelling halibut and prawn, which represents two of their most lucrative species (Kleemann, 2022).

These complexities, among others, emphasize the need for an impartial and well-informed approach to determine the course of action that would best serve the Greenlandic people.

OBJECTIVES

Given the current landscape where prospecting and confidential negotiations towards MDM are be the primary activities underway thus far in Greenland, this juncture presents a timely opportunity to identify key scientific, social, economic and environmental research questions. If successful, the project will lay the groundwork for crafting a compelling narrative for a full-length documentary while also charting a course for informing local communities about the mining proposal.

The project set out to address the following research objectives:

1. Gauge Awareness: *What is the level of awareness of the potential for MDM in Maniitsoq. Who in the community is aware and what are they aware of? Where did their knowledge come from?*

2. Identify Stakeholders: *Who are the stakeholders for a potential MDM industry in Greenland? What are their varying perspectives and attitudes towards MDM, if any? What pathways exist for them to be heard? Which stakeholders have had a voice?*

3. Understand Environmental Considerations: *What types of environmental impacts of MDM need to be studied on the coastal and subsea environments of Maniitsoq, Greenland, and how do they differ from those observed in Namibia? Are there any lessons learned from MDM in Namibia that can help inform operations in Greenland?*

4. Define Economic Frameworks: *What are the economic needs and sources of investment in MDM? Where would the royalties go? How much would Maniitsoq get vs the government?*

5. Collaborate to Benefit Greenlanders: *How can informative media content, such as documentaries and educational materials, be best utilized to raise public awareness to stimulate meaningful discussions about resource extraction near Greenland's coastal communities? Who are we doing this for? What is the best format for useful content and helpful deliverables?*

6. Identify Scientific Gaps: *What scientific needs do the people of Maniitsoq have, if any? How can our study aid in closing these gaps and advocating for future research?*

7. Use Objectives 1-6 to Create Deliverables.

METHODOLOGY

To achieve the objectives outlined above, this project employed a multifaceted strategy that integrated research, in-person stakeholder engagement, and media production.

Phase 1: The project began with an extensive research phase aimed at comprehensively understanding the unique environment, governance structure and economic state of Maniitsoq, Greenland. This involved a thorough review of relevant literature, academic

studies, policy documents, and industry reports. Key topics explored included historical perceptions towards mining, economic conflicts, and ecosystem processes. This research aided in the development of a list of questions for each stakeholder group that were asked during in-person interviews.

Phase 2: In-person interviews and meetings were conducted with personal release forms both in Greenland's capital Nuuk and the coastal town of Maniitsoq with a diverse range of individuals, including local residents, fishermen, policymakers, community leaders, scientific experts, and lawyers. These meetings provided valuable firsthand accounts, allowing for a deeper understanding of the socio-economic and environmental implications of a potential MDM operation. Video documentation of the fjord environment near Maniitsoq in it's pre-mining state was collected to ensure a "before and after" in the eventual future film.

Phase 3: Utilizing the video interviews and scenic content as a powerful medium for storytelling, the project focused on creating a compelling documentary trailer offering a glimpse into the issues to be explored in the future full-length film. Video content helped to inform the final film treatment, designating characters and outlining a plot.

RESULTS

Success metrics were assessed based on the extent to which research questions were answered and conveyed through the final film treatment. The documentary trailer should accurately reflect the perspectives of engaged stakeholders and effectively communicate the complexities surrounding the decision-making process. Additionally, success was measured by the establishment of relationships and trust built with stakeholders, laying the groundwork for future collaboration on the full-length documentary.

Brief results to research objectives are as follows:

1. Gauge Awareness: *There was minimal awareness of the De Beers Marine MDM proposal in Greenland. Members of the Greenland Institute of Natural Resources, the Mineral Resource Authority and other government representatives were the only personnel with any knowledge of the prospecting license. Individuals living in Maniitsoq had no knowledge at all. Information they now know has been learned from this project.*

2. Identify Stakeholders: *Stakeholders identified to be considered in a potential MDM industry in Greenland are local inhabitants of the settlements nearby the mining license areas, small-scale and industrial fishermen, climate scientists and economists (although there will surely be others). The perspectives of the local community members and fishermen in Maniitsoq are largely against MDM happening offshore for fear of the impacts to their local ecosystem. Economists and scientists in Nuuk have mixed reviews, commenting on the need for increasing financial stability and a worry about environmental preservation, respectively. At this time, it seems that there are no official avenues for Greenlanders to have a voice in the decision making process, despite the Mining Law stating public commenting periods are required.*

3. Understand Environmental Considerations: *The Arctic is known to exist on slower timescales that typical in warmer waters. Studies will need to be conducted to understand restoration length and feasibility. The seafloor and ocean currents along Greenland also differ from that of Namibia. Studies should be conducted on trailed sediment plumes. Greenland also differs in that it's coastline contains many unique fjord ecosystems. Research should be conducted to understand impacts of migrating fish a marine mammal species. As there are known impacts from MDM in Namibia, these will most likely guide the type of studies necessary for Greenland's exploration.*

4. Define Economic Frameworks: *As previously mentioned, Greenland receives an annual subsidy from Denmark, however, since Greenland has full sovereignty over its mineral resources. Accordingly, we learned that Greenland would not be required to pay Denmark any royalties on minerals and/or diamonds mined.*

5. Collaborate to Benefit Greenlanders: Crafting educational materials to be distributed through Facebook and local television will reach the largest audience, as these are the primary media outlets in Greenland.

6. Identify Scientific Gaps: *The main gap realized in this project was the overwhelming lack of awareness that MDM existed at all. Making research available to the local communities is critical for public education and engagement.*

DELIVERABLES

This capstone project serves as a crucial step to a larger ambition, setting the stage for the creation of a full-length documentary film. The project deliverables are strategically designed with the end goal of pitching this film to networks, foundations, and potential funders upon completion of the MAS MBC program. Essential components include a detailed film treatment to effectively convey the project's vision and potential impact, transcribed interviews, and the creation of a compelling 5-7 minute trailer titled *CLARITY*.

The title *CLARITY* reflects the film's mission to bring transparency to the often opaque diamond mining industry. Just as clarity in a diamond reveals its true value and purity, the documentary seeks to uncover the hidden truths and complexities of MDM, challenging viewers to consider the real cost of progress and the importance of environmental stewardship. The trailer briefly captures the dilemma faced by local communities, who are not aware of MDM's potential in Greenland, and marine scientists as they navigate the conflict between economic development, driven by a potential lucrative diamond mining, and the preservation of delicate Arctic ecosystems.

Lastly, the project developed a comprehensive film budget and funding plan to outline financial needs and opportunities for securing resources. Upon completion, the trailer will be translated to Greenlandic and/or Danish for local distribution in Greenland.

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