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Zachary Abbott
Dickinson College

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Natural Resources and Economic Power: the Development-Security Nexus of Greenland

Zachary Abbott

Introduction

With the melting of the arctic and the discovery of new resources, Greenland is positioned to experience great economic growth at a time when its financial wellbeing may become tied to its security. The tenets of liberalism suggest that Greenland's exploitation of new mineral and petroleum reserves would greatly benefit the country's development, as the process of globalization generates a growing demand for such valuable commodities. These resource reserves would permit significant economic growth over a long period of time, gradually enhancing economic wellbeing. As economic growth continues, Greenland will develop a greater level of economic power, making the country more resilient and thus better able to handle greater costs associated with its security and development. In the short-term, Greenland's exploitation of resources will require it to handle potential damages associated their extraction; in all-likelihood the country will be able to do this and enjoy greater economic power and freedom. In the long-run Greenland must contend with the threats posed by global warming and climate change, the displacement or loss of Inuit culture, and weak national security, brought about by globalization. These long-term challenges bear a higher price tag, and will test the country's economic resilience as it uses it new revenues to address these issues. Ultimately, Greenland has the potential to enjoy tremendous economic growth in the coming decades, but it must effectively manage its resource revenues to address long-term climate, cultural, and national security concerns that could undermine its existence as a nation.

When attempting to analyze the economic significance of natural resources in the context of globalization, a useful way to do so is through the lens of liberalism. There are several benefits to doing this. First, as a theory of international relations, liberalism is useful for analyzing interactions between not only nation states but also between external, non-state actors such as "NGOs, IGOs" and private firms; this is particularly important in understanding the connection between Greenland's government, private firms, and the global commodity market¹. Second, state behavior is in part determined by the "political, economic, and social choices of the people in those states" in addition to the actions of other nation states in the international system². This characteristic is particularly useful for understanding the economic significance of resources because it gives weight to the economy as a significant driver of national activity. Furthermore, the focus dedicated to other nation states highlights how resource consumption patterns

will help drive Greenland's economic development. This concept is especially well-demonstrated by the branch of liberalism known as "*commercial or economic liberalism*", which promotes "liberal markets" and the "flow of goods" as a means of boosting global welfare and economic "wellbeing"³.

Part of understanding the significance of minerals and oil to Greenland's economic development and security depends on understanding the role of natural resources in the global economy during the past century. The 20th century saw a steady rise in the amount of natural resources consumed by the planet, where from 1900 to 2005 "natural resource consumption rose by a factor of 8"⁴. The growth of resource consumption during this period is associated with "population growth and economic prosperity"; furthermore, resource consumption increased as more countries underwent the process of industrialization and transitioned to fully "industrialized" economies, as was the case of the United States and Europe and is currently the case with "China, India, and Brazil"⁵. The continued demand for resources by countries such as China is significant for Greenland's economic development, as the minerals and oil revealed by ice melt are in high demand. Following the premises of commercial liberalism, as more countries begin industrialization and see a rise in their economic prosperity, the demand for natural resources will likewise increase, meaning that countries with access to these commodities stand to enjoy significant and sustained economic growth. For Greenland, this means that the mineral and oil reserves being revealed by melting icecaps can serve as a steady source of revenue that will enable enhanced economic development and increased economic power.

Structure

The structure of this paper is based upon the model of systems analysis developed by Donella Meadows. Within Meadow's systems analysis, key components include the stock: "elements of a system that you can see, feel, count, or measure at any given point in time... a store, a quantity", the inflow valves that contribute to the stock, the outflow valves that reduce the size of a stock, feedback loops that regulate the rate of inflow and outflow, and the system boundary that limits the size of the overall system in question⁶.

There are two primary stocks featured in this paper: a resource stock and a monetary stock. The resource stock is harvested in Greenland, before moving to the global market (the system boundary), before being converted into hard currency (measured in US dollars). This money, the revenues from mineral and oil sales, is taxed by the self-government of Greenland to form a revenue reserve, the second stock featured in this paper. Collectively, these two stocks provide Greenland with economic power (see definition in footnotes)⁷ that it can use to further its development, and enhance its security. The resource stock does this by giving Greenland leverage over valuable raw materials which are desired by other

nations, while the revenue stock provides liquid assets which can be put towards development projects, or to pay for abatement measures that will mitigate both short and long-term security risks Greenland may face in the future⁸. Keeping in mind the significance of both of these stocks for Greenland's development and security, I will offer a new definition of economic power: the ability to use natural resources and resource capital to not only exert influence in the international community, but also to develop internal resilience to destabilizing forces. The initial inflow valves deal with the extraction of minerals and oil, which contribute to an overall resource stock (stock one) before moving through the outflow valves to the market where the resources are converted into a dollar value. In the second system, the inflow valve refers to the (tax) revenues gained from selling natural resources, which flow into a stock that measures potential national wealth. The outflow valves from this second stock represent the damages associated with future security threats or the costs of mitigation needed to avoid them. Collectively, these two stocks form an overall basis for a measurement of economic power, where Greenland can manipulate either stock to further its development.

In addition to the stocks of mineral and oil resources, and resource wealth, this paper also focusses on the overall ability of the Greenlandic system to handle shocks or unanticipated security concerns in the long-run; this is measured by the previously introduced concept of resilience. According to Meadows, "resilience is a measure of a system's ability to survive and persist within a variable environment"⁹ which, in the case of Greenland, concerns the country's ability to handle growing security problems such as climate change using revenues from resource exploitation. A basic measurement of Greenland's resilience would involve the quantity of tax revenues which contribute to overall economic power. A higher level of revenues would presumably indicate greater economic power and thus greater resilience; however, this isn't always the case. For instance, Greenland's economic power may decrease due to costs associated with damages or other system shocks, indicating a drop in resilience under these guidelines. However, if a shock is particularly big and Greenland is able to bear the damages associate with it, then this may in fact indicate a high level of resilience, especially if it wouldn't have been able to handle such events without tax revenues. In order to more clearly measure resilience, I will set thresholds associated with different costs and damages. The following are a list of positive and negative thresholds that indicate instances of increased or decreased resilience: If Greenland is able to gain complete financial autonomy from Denmark and maintain it, Greenland's mineral revenues will have made the system more resilient. If Greenland can handle damages associated with drilling, such as oil spills, or if it is able to invest in long term abatement solutions needed to deal with issues such as climate change, then that will also mark increased resilience. A failure to become more resilient

would take the form of damages that exceed annual revenues or the inability to continually implement long-term solutions to the threats from climate change, large-scale Inuit displacement, or a violation of Greenland's national sovereignty.

One final concept that is critical in this systems analysis and for understanding its potential weaknesses is Jared Diamond's concept of collapse. Diamond defines collapse as: "a drastic decrease in human population size and/or political/ economic/ social complexity, over a considerable area, for an extended time"¹⁰. In relation to Greenland's resilience, collapses encompass some of the security issues that require Greenland's government to effectively manage its economic power to address. In the case of icecap melt, a rise in sea level above three feet would result in the capital Nuuk being submerged underwater; this would result in the displacement of most of the residents in the area and the destruction of the political and economic center of Greenland¹¹. While Greenland does not have entire control over the rise in sea level, it may have the economic potential to invest in solutions or mitigation measures to prolong this system failure, representing an increased level of resilience. Another potential security issue that could result in a collapse would be the displacement of the native Inuit peoples, resulting in the loss of their traditions or altogether presence in Greenland. As Greenland invests more in its cities and less in sparsely populated rural areas, the Inuit people lose the potential for participation in the growing economy, while their primary means of subsistence, fishing, becomes increasingly dangerous as climate change progresses¹². This scenario would represent a decrease in Greenland's economic and social complexity, resulting in system collapse and another case of decreased resilience. These two collapse scenarios constitute long-term security issues that Greenland will be forced to address, and although Greenland may develop the revenue necessary to navigate these issues, failure to actively direct them towards a solution would ultimately lead to a less resilient country.

Minerals¹³

Part of Greenland's potential to benefit from globalization and commercial liberalism lies in its vast mineral reserves. For the purpose of this paper, four major minerals will be examined: iron ore, gold ore, zinc, and lead. The data used in the following section is drawn from the Geological Survey of Denmark and Greenland, the US Geological Survey, and individual firms. Due to the limited information on many ore deposits, mineral sites are only mentioned if there has been sufficient geological examination performed to give a plausible estimate of the size of any potential reserves.

The potential for iron has been examined both by the government of Greenland and major mining companies licensed to develop its resources. The projections for Greenland's iron ore potential at major mining sites are as follows:

the Issua site (according to London Mining Company) has a projected “955 million tons of ore at 33.43% Fe”, the Itilliarsuk site with “150-200 million tons of ore at 20% Fe”, the Gronnedal-Ika alkaline complex with an early-estimated “.8 million tons of ore at 25-30% Fe”, and the Isortoq site has (according to Hunter Mining Inc.) an “inferred one billion tons of ore at 62.6% Fe”¹⁴. Collectively these four sites have the potential to yield 2.1-2.2 billion tons of ore, with roughly 1-1.2 billion being pure iron ore. In addition to these four sites, there are other mining projects such as the Bugt site (owned by Red Rock Resources) with a projected “67 million tons of ore at 31.4% Fe” and “12 additional sites” with an estimates “158-470 million tons of ore at 27-47% Fe”¹⁵; these additions bring the total ore quantity to 2.3-2.7 billion tons of ore, with roughly 1.1-1.5 billion being pure iron ore. At the October 2015 price for one dry metric ton of iron ore, “\$52.74”¹⁶, the total value of these ore deposits is equal to \$110.754 billion-\$142.398 billion.

Another resource that has emerged as economically significant in Greenland is gold, specifically at the Nalunaq gold mine site. Crew Gold Corporation originally started mining in the area in 2004 on a 400,000 ton reserve of gold ore; however the company also estimated an additional “1.67 million tons” could be available for exploitation, lasting “for a period of three to ten years”¹⁷. The estimated average of gold in this reserve would be “18 grams per tonne”¹⁸; this would put the total amount of gold that could be extracted from this specific part of the Nalunaq site at 30.06 million grams of gold. At the current price per gram of gold, “\$35.23”¹⁹ this equates to a total of value of (roughly) \$1.521billion. While gold mining is concentrated in Nalunaq, there is strong potential for more gold to be discovered in the surrounding region²⁰, thus the figures listed here should not be considered representative of Greenland’s entire gold reserve.

Zinc and lead, often found in the same ore deposits, are other widely used minerals Greenland may put towards economic development. While little exploration has been conducted in Greenland, several larger mining projects offer projections about potentially exploitable ore deposits; these include: the Citronel Fjord with a projected “131.1 million tons of ore with 4.1% ZN, .5% Pb, and 2% ZN cut-off”²¹²², the Black Angel mining site, a once active mine that still contains an estimated “two million tons of ore at 12.3% Zn and 4%Pb”, and areas such as the Franlinian Basin and Karrat Group mines which demonstrate geological evidence for zinc deposits²³. The identified Citronel and Black Angel Mining sites could yield a maximum total of 133.1 million tons of ore, with 5,621,100 tons of pure zinc ore and 735,500 tons of pure lead ore. The value of this zinc ore at the market price of “\$1,724.34” (monthly average) per ton²⁴ would be roughly \$9.69 billion; likewise the value of the estimated lead ore at the market price of “\$1,720.11” (monthly average) per ton²⁵ would be roughly \$1.27 billion. The combined value of these two ore loads, roughly \$10.96 billion, indicates great economic potential for Greenland from zinc and lead mining projects, especially if the Franklinian and Basin and Karrat mines yield large amounts of ore in the future.

Oil

In addition to minerals, speculated reserves of petroleum in Greenland's territory within the mainland and internationally recognized ocean boundaries of the country promise to yield substantial (tax) revenues once drilling capabilities have been maximized. Recognized as a critical energy source by the international community and a raw ingredient in multiple consumer products, there has been a great amount of speculation regarding the rough amount of oil in the Arctic and the amount possessed by Greenland. One estimate states that there could be "31 billion barrels of oil" under Greenland's jurisdiction, and with the rapid rate of ice melt in the region, these resources will be easier to extract and exploit²⁶. However, while Greenland is quickly gaining access to more oil reserves, calculating potential revenues from petroleum is difficult. Oil prices can fluctuate wildly depending on several factors, such as the number of market suppliers, overall supply and demand, wartime strains on oil reserves, and price manipulation by countries²⁷. In order to calculate potential revenues, I will establish a range based on recorded highs and lows from the previous fifteen years. Since 2001, oil prices steadily increased until they reached a peak price of "\$132.55 per barrel"²⁸ before quickly dropping in 2008; since then oil prices over the next several years were an average of \$100 per barrel until a drop in 2014, with the current price around \$46 per barrel²⁹. In order to capture the large changes in price due to various man-made and technological factors, I will set the potential price range at \$46-\$100 dollars per barrel, which is based on the high and low prices of the past 15 years. Using this range of prices, the potential value of Greenland's oil reserves ranges from \$1.4-\$3.1 trillion dollars. While this range of potential revenues indicates tremendous economic potential for Greenland it is important to remember that oil prices can fluctuate dramatically, and that Greenland does not actually receive all of these revenues; the latter is a critical point that will be discussed later.

Potential Benefits

With the creation of a tax-revenue stock, Greenland will gain the economic power necessary to achieve a variety of political, economic, and developmental goals. One of the most significant goals the Self-Government of Greenland currently has is complete financial autonomy from Denmark, which will eventually lead to full sovereignty; in order to achieve this goal, Greenland must make an additional "\$655 million" per year³⁰. While extensive exploration of Greenland's newly available reserves has not yet been conducted, the market values of the previously mentioned iron and gold deposits suggest that this goal is a potential reality. As more exploration is done and technology improves, the amount of revenue Greenland can earn from mineral exploitation will increase, allowing it not only to cover its own budget but also accumulate a surplus that it can use to cover other potential expenses. Other potential benefits of increased

resource extraction would be revenue surpluses that could be used for investment in infrastructure and job creation. Initial investments in necessary infrastructure such as seaports, airports, and medical professionals needed to maintain larger mines, combined with the creation of jobs for unskilled, semi-skilled, and skilled workers alike would generate growth across the entire economy³¹. While early revenues will likely be stymied by needed investments in basic infrastructure, within a few years Greenland would be able to invest more in developing advanced infrastructure and training its own professionals who will serve as drivers of the economy in coming decades.

Valuation of Resources and the Magnitude of Economic Power

In measuring the impact of resources on Greenland's economic power, it is important to ask: how much of the revenue does Greenland actually receive from extraction activities? The first step in determining this is understanding Greenland's property rights to the resources within its territory and how it regulates their use. According to the Mineral Resource Act of 2009, the Self Government of Greenland has exclusive rights to all land and natural resources within its territory, independent of Danish control, with the additional right of being able to issue licenses to prospective firms seeking to extract these resources³². With property rights established, it then becomes necessary to ask how Greenland earns revenues from these resources, as it allows outside firms to purchase the rights to develop and exploit these mineral and oil reserves.

There are roughly three ways in which the Greenland Government earns revenues from resource extraction: through royalties based on the amount of minerals/oil extracted, corporate taxes, and other negotiated fees that have been negotiated with firms in the region³³. With regards to the revenues from its resources, the Government of Greenland earns a set percentage of the revenues made by firms who are extracting minerals and oil in Greenland's territory; this means that at any point in time, Greenland only earns a fraction of what its resources are actually worth. The precise amount earned by Greenland varies slightly and it may be subject to change as resources become a more vital part of the economy.

Currently, Greenland earns "53%" of revenues from oil extraction within its territory from a combination of corporate taxes, withholding, and surplus royalties; under the 2014-2018 Mineral and Oil Strategy, this level of taxation and fees is recommended to remain the same, reducing the likelihood of a fluctuation in rates³⁴. In contrast to oil, mineral-based tax revenues may change in the next few years depending on the potential adoption of new taxation and royalty policies. Currently, Greenland earns "38.4%" of all revenues from iron ore, "37%" of all revenues from gold ore, and "38.7%" of all revenues from zinc ore, averaging around "37%-38%" across all mineral groups³⁵. Several proposals have been set

forward in the Mineral and Oil Strategy recommending slight increases in royalties and taxes, with a long-term sustainable (competitive) rate of government revenues being between 40%-42% of total revenues earned on all minerals³⁶. With these recommendations in mind, I will set the range of potential mineral revenue earned by the Self Government of Greenland to be between 37% and 42% of total revenues when calculating a number to represent Greenland’s revenue stock in the future.

With information on mineral and oil reserves, market prices of resources, and taxation policies it now becomes possible to calculate a rough level of net-benefits for Greenland’s economy in the future; this number will in turn be used to represent Greenland’s potential economic power and overall economic resilience in the coming decades:

If Greenland fully exploits the listed oil and mineral resources, the government has the potential to make between \$742 billion to \$1.643 trillion throughout the lifetime of these mines and drilling sites. Calculating an average annual revenue presents a slightly difficult challenge, as the life of a mine often varies based on the resource and the efficiency of extraction technology. While not all mines are operating a peak capacity as of now, in the future they stand to make a substantial amount of annual revenue. Spread over a period of 50 years, resource extraction would result in an average annual revenue of \$14.4-\$32.86 billion.

Measured Benefits of Mineral and Oil Extraction						
Resource	Calculated Raw Quantity ³⁷	Calculated Pure Quantity ³⁸	Unit Value (\$)	Total Value (\$)	Tax rate (%)	Greenland’s revenues (\$)
Iron	2.3-2.7 billion tons	1.5 billion tons	52.74 (\$/ton) (October 2015) ³⁹	110.754-142.398 billion	.37-.42	40.97-59.8 billion
Gold	1.67 million tons	30.06 million grams ⁴⁰	35.23 (\$/gram) (October 2015)	1.521 billion	.37-.42	562.77-638.82 million
Zinc	133.1 million tons	5.6211 million tons	1,724.34 (Monthly average) ⁴¹	9.69 billion	.37-.42	3.58-4.069 billion
Lead	133.1 million tons	735,500 tons	1720.11 (Monthly average) ⁴²	1.27 billion	.37-.42	469.9-533.4 million
Oil	31 billion barrels ⁴³	31 billion barrels	46-100 (15 year range) ⁴⁴	1.4-3.1 trillion	.53 ⁴⁵	742 billion-1.643 trillion

Greenland’s Total Tax Revenues: \$742 billion to \$1.643 trillion

Although it is impossible to calculate the true value of every natural resource that will become available to Greenland in the future, this range is designed to indicate potential for economic growth and establishing a base level of economic power. In the coming paragraphs, I will use the lowest point in this range as a measurement of Greenland's revenue stock and economic security. In order to test Greenland's economic-based resilience in the system I will examine costs associated with security threats arising from Greenland's mining activities, along with long-term threats associated with issues such as climate change. If costs associated with these threats remain under the minimum level in the previously stated range, then it will count as an instance of Greenland being sufficiently resilient to handle the issue. If the cost of the security threat, whether it is international, national, or human in nature, or the abatement costs for potential solutions exceed the minimum, but not the maximum, then it will indicate that Greenland may be able to handle the issue, indicating a questionable level of resistance. If Greenland incurs large costs in a short period of time that exceed average annual revenues, or if Greenland is incapable of minimizing the impact of damages associated with issues such as climate change and Inuit displacement, then it will indicate that mineral and oil revenues have not made Greenland sufficiently resilient to address these security issues.

One of the potential costs/ security issues associated with Greenland's resource exploitation are oil spills at drilling sites. Under the Mineral Resource Act, the actors who cause pollution or damage the environment are responsible for the immediate damages caused by the polluting incident and any restoration costs associated with cleanup⁴⁶. By law, Greenland does not bear the costs for handling oil spills or environmental damage; however, it must handle the potential lost revenues associated with damage to its fishing industry, the lost revenues from the spilt oil, and cleanup costs prior to reimbursement by the polluting party. Fishing and shrimping accounted for "89% of exports in 2010" out of a total "\$384.3 million" in fishing revenues. An oil spill off of Greenland's coast could have severe repercussions on the fishing industry by killing off fish and shrimp by the coast and preventing fishermen from operating in the area until the spill has been addressed. This would mean a loss of income for many Greenlanders, especially Inuit people who rely on fishing for subsistence⁴⁷. In terms of lost revenues, the value of the oil depends upon the size of the spill. One of the worst potential situations would be a replication of the BP oil spill in 2010, which released "an estimated 170 million gallons of oil" into the Gulf⁴⁸. Were Greenland to suffer such a spill, it would cost the Government roughly \$4.15-\$9 billion in tax revenues⁴⁹. While this would significantly impact Greenland's revenue stock in a given year, even at the minimum annual level of revenues, \$14.4 billion, Greenland would be able to handle the loss of revenues from both the oil and fishing industries while still maintaining autonomy from Denmark.

This indicates increased resilience in Greenland's economy. However, the loss of access to fish stocks could damage the livelihood of fisherman and result in increased joblessness, creating temporary if not long term instability.

Climate Security

While some of the damages associated with resource extraction present an immediate threat to Greenland's economic security and resilience, other issues are more likely to reveal themselves over the course of decades or hundreds of years. Considered a "mega-catastrophe, an event that would cause irreversible damage", the issue of climate change and ice melt in Greenland is unlikely to rapidly create a disaster which would threaten system resilience⁵⁰. Although a significant rise in ocean levels would threaten many populations in Greenland and constitute a system collapse and poor resilience, the dangers associated with this specific threat are not as immediate as those caused by an oil spill. The Fourth Intergovernmental Panel on Climate change concluded that the sea level would only rise by ".2-.3 meters by 2100, with a rapid melting of ice leading to a .6 meter change at worst"⁵¹. This falls short of the one meter sea level rise needed to flood Greenland's capital Nuuk⁵². However, in spite of the IPCC's findings, rapid glacial melt is not impossible in the present; if such an event were to occur, ocean levels would rise much more quickly than predicted. A recent study of the Nioghalvfjerdingsfjorden and Zachariae glaciers have revealed that ice is melting more rapidly due to simultaneous heating of the ocean, heated runoff from the top of the glaciers, and eroding glacier support in the ice sheet⁵³. These findings accelerate the potential timeline for climate change to become a pressing and immediate security issue. Furthermore, while it may take over a century for the entire ice sheet to melt enough to cause catastrophic flooding, the destruction of individual glaciers may still yield a considerable rise in ocean levels. In the case of the previously aforementioned glaciers, their combined collapse would result in a rise in sea level "over three feet"⁵⁴, which would be enough to flood Nuuk. Even if Greenland were to build its revenue stock towards the maximum anticipated level of \$1.4 trillion by the time of the disaster, the loss of Nuuk would destroy a critical political and economic center and result in a mass population displacement, creating a system failure which Greenland could not recover from while shattering any resilience the country may have built up.

In order to avert or mitigate the damages associated with ice melt and climate change, Greenland will need to cooperate with other nations and be willing to dedicate a considerable amount of revenues towards mitigation measures. One potential solution that is being conceptually explored is the use of geoengineering to remove CO₂ from the ocean through algae growth, or to reduce the earth's absorption of sunlight by spraying particulate matter into the air⁵⁵. Although this type of technology is still under development, it takes the steps necessary to not

just to limit future CO₂ levels but also to reduce the amount currently within the environment, which would slow the warming rate of the earth and thus delay a flood-based collapse in Greenland. The difficulty with this approach comes from its reliance on a large scale global commitment to implement the solution and the long-term period over which it must be implemented. In addition to the potential for causing environmental damage through increased carbon levels in the ocean, discharging particulate matter into the atmosphere must be sustained over a long-period of time; if this effort were terminated early, it would actually cause a spike in global temperature and greatly exacerbate the warming of the planet⁵⁶. Furthermore, Greenland would only be able to contribute to these efforts on an annual bases if other countries helped fund such bioengineering projects. With a speculated price tag of “\$25-\$50 billion” annually, Greenland could reasonably fund 10%-20% percent of such a global effort on an annual basis (\$2.5-\$5 billion out of a low annual average of %14.4 billion); however, if few to no other countries participated in this project, Greenland would not be able to fund the project on its own⁵⁷. This would be economically unfeasible, resulting in not only decreased resilience but also economic collapse. In order to decrease the chance of bearing a disproportionate cost, Greenland must actively engage with the international community to draw attention to the potential for these technologies while simultaneously setting aside a considerable amount of its own revenues to funnel into research and development projects. Doing so would increase Greenland’s resilience, while a failure to do so may lead to a system collapse. Luckily, the conclusion of the 2015 Paris Climate Talks has yielded a broad agreement among most countries about the need to work to cut CO₂ emissions and combat global warming, potentially allowing Greenland to contribute to a solution while maintaining a considerable level of economic power afterwards.

Inuit Population Security

Another long-term, human security concern faced by Greenland is the potential displacement of the Inuit people due to climate change and the inability to participate in the global economy. Inuit peoples are by tradition subsistence fishers and hunters whose primary economic activity occurs mostly separated from the modern global economy⁵⁸. In addition to subsistence, fishing and hunting have deep cultural significance for the Inuit people⁵⁹. Over the past several decades, the Inuit people have generally been able to adapt to their changing environment and integrate into the modern Greenlandic economy; however, they have been facing increased pressure from both climate change and the government of Greenland’s efforts to more efficiently manage the country. As climate change progresses, the sea ice which used to provide a foundation for fishing has begun to recede, exposing fishers to more dangerous environments in open waters⁶⁰. Additionally, efforts by the Greenland government to “centralize”

the region by promoting economic investment in cities has resulted in the closing of significant health and education infrastructure in areas with few inhabitants, while drawing more people to urban areas despite a lack of job growth⁶¹. As a result, despite Greenland's effort to promote economic growth and prosperity for all of its denizens, it has removed key services from areas traditionally inhabited by Inuit peoples and has failed to provide work opportunities needed to replace subsistence style living in some areas of the country.

Another issue that could result in the decline of Inuit participation and presence in a developing Greenland are conflicting disputes over cooperative resource management and a lack of communication between local communities and the government regarding resource exploitation. In the Arctic region, indigenous people who previously relying upon local resources for subsistence and "long-term economic growth", must now negotiate resource use with the modern Greenland government; however, they are often "politically and economically disadvantaged", leading to tensions over land use and resource extraction due to the superimposition of national land management systems over their own⁶². Overlapping management systems, especially if there is a lack of dialogue between local communities and governments or corporations, leads to situations where traditional resource use is overshadowed or ignored during resource manipulation and isn't incorporated in development plans. This often excludes indigenous peoples of the Arctic from economic growth while suppressing their traditional methods of land management. A related issue is the lack of communication between the government and local communities. After a presentation by London Mining to government officials and select members of the community, local populations were concerned by what they saw as "a lack of transparency by the government... and a lack of information on the project"; in particular, they were concerned about being placed on the sidelines of Greenland's development, becoming "observers in their own country"⁶³. The exclusion of local communities from their country's development further places them outside of the modernization of Greenland, effectively marginalizing them both economically and culturally. This cultural and economic isolation of indigenous people constitutes another collapse scenario, translating into a failure of resilience and a major flaw in the country's development and cultural security.

While the continued exclusion of Inuit peoples from the development process and the ignorance of their traditions will lead to a system collapse, Greenland has several chances and opportunities to prevent this from occurring. The government of Greenland can work to preserve culture by raising greater awareness of the issues that impact Inuit peoples, relying on momentum from growing awareness of climate change and a rising youth interest in "Arctic culture"⁶⁴. Using preexisting momentum from related movements would allow the Self Government of Greenland to draw attention to the culture of the Inuit

peoples and the problems they face through threats such as global warming, while preserving its economic power. This saved economic power could be used on infrastructure projects to raise both the living conditions of native communities and to provide job opportunities for Inuit persons who could no longer rely on subsistence activities to survive. Another way of addressing the issue of poor communication and marginalization would be to “educate” local populations on their opportunities to participate in discussions on projects and encourage debate to prompt officials to take their opinions into account⁶⁵. Such efforts would result in a greater dialogue between Inuit peoples and the Greenland government, ensuring that local communities would be active in the country’s development and that their opinions wouldn’t be marginalized. This would help to prevent a system collapse, costing Greenland only a fraction of its economic power to fund such programs and increase national resilience.

National Security

One final security challenge that Greenland will be forced to deal with are risks to its national sovereignty. As it currently stands, while Greenland has full control over the resources within its borders, its “foreign, defense, and security policy” are still controlled by Denmark⁶⁶. Although Denmark will likely have a vested interest in ensuring Greenland’s sovereignty, if Greenland is able to gain complete autonomy through mineral revenues, then the Self-Government would become responsible for the provision of its own security and defense policy and forces. This autonomy may yield a national security challenge in the current global environment, with multiple nations staking their claims to the Arctic and its resources. Russia is one country that presents a potential challenge to Greenland’s security, given its aggressive claims to large swaths of territory in the Arctic⁶⁷. This concern is emphasized by *The Fundamentals of Russian State Policy in the Arctic up to 2020 and Beyond*, where Russia “vowed to establish military and coastguard groups to protect its new economic interests in line with its extended Continental Shelf claim and stated that the Arctic would become ‘the country’s top strategic base by 2020’”⁶⁸. With Russia making a large territorial claim directly adjacent to Greenland, the introduction of a foreign military force presence poses a hazard for the Self-Government, which relies on Denmark for its defense. If Russia were to assert claims over a piece of territory claimed by Greenland, the Self-Government would not have the military capacity to prevent a Russian incursion⁶⁹ into Greenlandic territory, which could negatively impact access to resources in the area and slow overall economic development.

In spite of this potential national security threat posed to a sovereign Greenland, the new country could leverage its mineral reserves stock and the (increasingly) liberal international order to bolster its security. In addition to Russia, many countries such as the UK, Norway, Canada, Denmark, Australia,

and the US have expressed an interest in the region due to its oil reserves⁷⁰. Wide international interest in the arctic resources benefits Greenland's security because other countries will likely take steps to protect their own economic interests or work to promote general stability in the region. This position is reflected in India's view of the arctic, which entails not only developing research stations, shipping routes, and exploiting resources, but also working with other countries to "[make] the Arctic a region of peace and stability, demilitarized sea space..."⁷¹. Additionally, particular interest in Greenland by major international powers will provide Greenland with multiple security guarantors in the event of a rogue Russia or alternative state seeking to claim the arctic for their own. Both the UK and China have a vested stake in Greenland specifically, with the London Mining company planning "to use thousands of Chinese workers" to build its "\$2.35 billion" iron mine⁷². With major revenues in terms of mining and remittances from workers, both the UK and China will have an incentive to uphold Greenland's national security and sovereignty if for no other reason than to protect their own economic interests. Collectively, the economic interests of multiple countries in the Arctic and Greenland will act as a check on the other powers, such as Russia, who wish to benefit from the region's resources; this will consequently prevent a potentially hostile confrontations over Greenland's rights to its minerals absent Denmark's protection.

The last way in which Greenland's stocks of resources and growing economic power could be used to ensure its national security is through the shift of the world towards an international order based on the tenets of liberalism. As previously noted, liberalism places emphasis on both international cooperation and economic liberalization to achieve a more peaceful and prosperous world⁷³. The organizations that are forming or growing due to increased cooperation, such as the Arctic Council, offer Greenland the opportunity to gain sovereign recognition while partnering with other nations to address a variety of issues. Serving as a forum for nations dealing with trade and shipping matters, among other issues, the Arctic Council has expanded recently, with "5 new non-arctic states successfully lobbying for observer status", including influential nations such as India and China⁷⁴. As Greenland continues to expand its resource extraction activities and becomes an integral market actor, other members will recognize its significance in the region, thereby conferring legitimacy on what may be a newly sovereign nation. This recognition of importance will likewise lead to greater recognition of Greenland's territorial boundaries and legal rights to exploit resources in its area, securing national sovereignty through mutual recognition of the country's importance. Additionally, through increasing mineral agreement with various countries and companies, Greenland is slowly bringing itself into a liberalist international order where economic cooperation and development lead to the creation of stability. By continuing to participate in trade and further collaborate with other nations,

Greenland both passively and actively promotes its national security in the context of an international world order dominated by liberalism.

Conclusion

The demand for resources in a liberal international order undergoing increasing globalization promises to generate significant growth and economic power for Greenland. Tax revenues from iron, gold, zinc, lead, and oil extraction promise to yield substantial annual returns that will enable Greenland to invest in its infrastructure and gain autonomy from Denmark. In terms of costs associated with exploitation activities, Greenland could feasibly handle the costs associated with an oil spill or a decrease in its fishing industries, indicating an increase in resilience. In terms of addressing long term security issues, Greenland has the potential to mitigate the impact of climate change, Inuit displacement, and national security threats, if it manages its mineral resources properly. Analyzed in the context of a security development nexus, Greenland's development will give it the economic power needed to address multiple security issues, while increasing resilience and tackling security issues would pave the way for continued growth, constituting a "positive sum relationship"⁷⁵. Ultimately, through the exploitation of mineral resources, Greenland is on the verge of a period of tremendous economic growth that, should the revenues be well invested, will insure Greenland remains secure while making it an important actor in a growing liberal international order.

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