Asian Pacific Journal of Environment and Cancer
Vol 5 No 1 (2022), 25-43
Review and Meta-analysis

Assessing the Impact of Arctic Melting in the Predominantly Multilateral World System

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According to the global average, the Arctic is melting twice as fast as the rest of the world. Increasing temperatures in the polar regions area are in line with greenhouse gas emissions, implying that anthropogenic forcing is causing Arctic climate change. Arctic sea ice is quickly receding, resulting in a shifting geopolitical environment, among other things. Russia, Canada, the United States, Denmark, Norway, Iceland, and Finland–are the most important players which are called as Arctic eight, also China has made major attempts to establish itself as an Arctic participant. Aside from political maneuvering for power, the Arctic is a major source of concern for the whole world. Changes in the Arctic climate have worldwide consequences since its natural climate systems govern global climate systems and chill the globe. It is expected that by the end of the century there will be no ice in the summers in Arctic. The possibility of ice-free Arctic seas has sparked study on the use of the Northern Sea Route and the Northwest Passage as international trade routes, according to a growing scientific agreement. If these Arctic rivers are made commercially viable, transit times may be cut in half, encouraging increasing bilateral trade between major western European trading ports and northeast Asian powers like China, South Korea, and Japan. Proclamations of a rapidly changing foreign trade environment, on the other hand, are unfounded and exaggerated. A catastrophic lack of resources, a Russian dominance on transit costs, exorbitant insurance premiums, and extreme data scarcity are just a few of the many hurdles to shipping across these Arctic seas. This notion that worldwide trade would soon migrate northwards is one of the Arctic myths that is propagated by the mainstream media, and it serves to obscure the actual complexity of the Arctic melting. Mass media frequently promotes stories of a looming global war over unclaimed Arctic hydrocarbon resources, indicating a link between melting ice and sovereignty issues. Massive oil and natural gas deposits exist beneath the Arctic Circle. According to the US Geological Survey, the Arctic holds roughly 13% of the world's undiscovered oil reserves and nearly 30% of the world's unknown natural gas reserves. The melting ice covers a variety of responses from the fossil fuel businesses in Arctic nations. Most importantly, as ties with the West worsen, Russia intends to increase its offshore drilling and exploration, supported by investments from an enthusiastic China. Other countries, such as Canada and Norway, who rely heavily on oil and gas exports, play with sustainable investments in other areas while their fossil fuel businesses continue to operate largely unimpeded by calls for environmental sustainability. To ignore such nuances is to miss out on a thorough grasp of the Arctic's geopolitical potential and challenges.

Introduction

Chapter 1

1.1 Research Background

The Arctic and its seas have seen major climate changes since the turn of the twentieth century. A significant warming of the Arctic occurred between 1910 and 1940, followed by a cooldown that lasted until 1970. Warming in the early twentieth century was only observed in the Arctic, and was caused by long-term variability in Arctic climate systems known as the Atlantic Multidecadal Oscillation (AMO) [1]. Seasonal ice coverage variation is another characteristic of the Arctic environment. A variety of additional variables and events, including as surface air temperature, ocean circulation patterns, cloud cover, water vapor content, and heat fluxes, all impact sea ice coverage. It should be emphasized that September marks the conclusion of the typical Arctic melt season, as well as the lowest yearly ice covering in any specific location. On a yearly basis, March signifies the apex of the cold season and the highest Arctic ice covering. This study will commonly use September and March as reference months to compare current and predicted trends to observed data [2] (Figure 1).

Figure 1. Seasonal Fluctuation of Arctic Sea Ice, Source, Arctic ROOS. (The figure is taken from reference number [41]).

The climate in the Arctic varies as well. Stormy and rainy winters are contrasted by cold and overcast summers in Coastal climates such as those found in northern Russia, Scandinavia, and Iceland. The climates of the continental Arctic are drier, with harsher winters and higher sun exposure in the summertime. This is significant because it demonstrates the difficulties and limits that come with seeing the Arctic as constant and unchanging. The overall unpredictability of Arctic temperatures and weather patterns is a substantial impediment to both future climatic forecasts and the navigability of Arctic waterways [3].

The Arctic is portrayed in popular culture as a vast, pristine expanse of snow, with deep green coniferous trees covered in dense powder and snow mounds collapsing beneath the polar bear's stride. This idealized picture of the Arctic ignores how the geopolitical environment of Arctic is transforming as a result of human climate change, as well as the region's significant subtleties and regional variations. The region above the Arctic Circle— a line that circles the globe at 66° 34'N–is a more precise and scientifically acknowledged definition of the Arctic. Summer temperatures at these high latitudes rarely exceed 10 degrees Celsius [4]. This comprises Baffin Bay, the Barents Sea, the Kara Sea, the Beaufort Sea, the Chukchi Sea, the East Siberian Sea, the Greenland Sea, Hudson Strait, and White Sea. Canada, the United States, Russia, Greenland, Finland, Iceland, Norway, and Sweden all have land and oceans in the Arctic. These eight countries make up the Arctic Council, which is an international organization that tackles social, economic, and environmental concerns in the Arctic. Greenland is represented by the Kingdom of Denmark. According to a significant new research modelling how Earth's frozen areas would respond to ever-increasing greenhouse gas emissions, limiting global warming to 1.5 degrees Celsius may reduce the amount of sea level rise due to melting ice sheets this century. Melting land ice has contributed to at least half of global sea-level increase since 1993, and experts have previously warned that the massive ice sheets may melt. The climate in the Arctic is not consistent throughout all of the countries that make up the region. The Canadian Arctic, for example, is one of the world's most inhospitable environments, but the Norwegian Arctic is more moderate and livable [1]. While addressing climate change and its consequences, it is referred as "the Arctic" as if the Arctic vastness is so uniform that it can be classed as a single location. This assumption is mostly for the purpose of convenience. Precision is traded for comprehensibility in order to avoid losing sight of the broad picture in a thorough examination of the various degrees of variance within the Arctic area. As a result, while this study will continue to refer to the Arctic in broad, undefined terms, it is critical to recognize the limits of this approach and to focus on the actual complexity that plague discussions about the Arctic [5].

1.2 Identification of the Problem

The Arctic melting is a serious problem that affects not just humans but also many wildlife species. The melting of Arctic sea ice will almost certainly result in more climate change. This is a concern since climate change has an impact on nearly every aspect of human life, including plants, animals, weather, and trade. The melting ice will have an impact on transportation in the Arctic, especially commercial traffic. Many nations are already fighting for access to Arctic trade channels if the major thaw occurs. Ocean water temperature and its current flow patterns have an impact on global weather patterns. We chose humans as the creature harmed by the melting Arctic Sea Ice because we rely on animals and plants for sustenance and rivers for commercial activities [6]. The Northern Sea Route is beginning to be impacted by the most recent event of Arctic melting. The whole route is in Arctic seas, and portions of it are only open to the public for two months a year. The of climate poses a direct threat to biodiversity in many areas of the world, but nowhere is it more apparent than in the Arctic, where the effects of the climate crisis are felt sooner and more severely as compared to other places. Since 1949, winter temperatures in the Far North have risen by about ten degrees Fahrenheit; by the end of this century, yearly average temperatures in the Far North are predicted to climb by nine degrees or more on land and up to thirteen degrees on sea. The rapid and destructive melt of the region's sea ice demonstrates the terrible impact of the Arctic's rising temperatures. Arctic summer sea ice reached its lowest area since the start of the satellite era in 2007 — while winter sea ice reached its lowest extent since 2006 (Figure 2).

Figure 2. The Extent of Arctic Sea Ice.(The figure is taken from reference number [42]).

Climate experts now predict that in 2030s, the Arctic will be totally ice-free in the summer [4].

Countries will dispute over portions of the Arctic sea ice, marine mammals' habitats will be jeopardized owing to the lack of ice, and it will impact how the creatures live in their ecosystem. Our society's fossil-fuel dependency is endangering the health of the far north. Oil corporations are racing to drill in the Arctic, like people on the beach chasing retreating ocean waves to grab seafood before a tsunami, with the only objective of producing more of the fuel that causes global warming in the first place [7]. Complicating things more, the Arctic's increasingly ice- free seas are beset by a profusion of shipping routes, which account for around 3% of global carbon dioxide emissions. Oil production and shipping pose a threat not just to polar bears and ice seals, but also to the North Pacific right whale and bowhead whale, both of which visit the frigid seas of the Arctic. Furthermore, bringing additional black carbon emissions from ships into the Arctic would hasten melting and jeopardize our final opportunity to rescue the region.

The Center has achieved some important victories in the battle against Arctic oil exploration, and we're also trying to reduce emissions from ships and planes. Substantial reduction in greenhouse gas emissions across all sources, however, are the only option to conserve Arctic animals' habitat and assure their existence. The tremendous melting of the Arctic is merely an early warning of the larger climate catastrophes that will occur if we do not act fast. Saving the Arctic necessitates particular initiatives to address more immediate dangers like as oil extraction and shipping, in addition to wider local, national, and international actions to reduce CO2 and other greenhouse gas emissions [6]. These changes imply that preserving the Arctic a conflict-free zone will become increasingly essential, and maybe more difficult, for governments. The eight Arctic nations of Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States will confront regional challenges such as coastline erosion (Figure 3), loss of traditional livelihoods, and the need to monitor the environment as a result of a more open Arctic.

Figure 3. The Arctic Region. (The figure is taken from reference number [43]).

There will also be new problems in ensuring the safe management of rising shipping traffic and other commercial operations, as well as juggling the concerns and actions of the expanding number

of non-Arctic actors who are becoming increasingly interested in the new Arctic [8].

1.3 Limitation of the Problem

Talking about geopolitical approach such as Arctic melting there are certain limits of multilateral world system which geopolitics does not or cannot explain. Starting with realism. We must keep in mind that geopolitics is quite similar to realism. The key variable for realism is power in general, and the major problem for realism is war and peace, specifically when governments go to war and under what circumstances they decide to proclaim peace with one another. The area of realism known as structural realism or neo-realism examines the importance of structure in international relations and how existing structures impact state action [9]. For example, global politics focuses on the location of power rather than power itself in a broad sense, and how geographic variables impact the issues of power.

In other words, whereas power is the most significant variable in realism, the ability to project power in a specific location is more important in geopolitics, even if the state, a specific state, has a little less strength than its opponent. Is it more essential to talk about influence in a particular location in geopolitics than it is to talk about war and peace issues? Global politics has always been about retaining power and control over certain locations, trade routes, and so on. Henry Kissinger was the only politician who sought to integrate these ideas, and we remember his approach, which was about global equilibrium or the importance of geopolitical issues, and power imbalance. To put it another way, the two techniques may be blended, which is a positive thing. However, we have just highlighted few of their characteristics [10].

1.4 Formulation of the Problem

Keeping in view the limitation of the problems above, the formulation of the problems could be organized as follows:

1. In what way will the melting of the Arctic change country relations?

2. Will the power relations be affected?

3. Will pre-existing treaties also be affected?

1.5 Significance Of The Study

Arctic melting has a tremendous impact on our livelihoods, health, and future. It impacts almost every element of our existence, from our food supply to our transportation as well as infrastructure. Climate refers to the long-term pattern of meteorological conditions in a certain location. We know that people are causing global warming, and that these changes are already having a significant influence on our lives. It is significant that we comprehend how the climate is changing in order to plan for the future. Climate research allows us to forecast how much rain the next winter will bring, as well as how much sea levels will increase as a result of rising sea temperatures and Arctic Melting. Similarly, we can also identify which places are most vulnerable to extreme weather and which animal species are most endangered by Arctic Melting [11].

Moreover, how the melting of Arctic will change country relations is a good way to get a more in-depth knowledge of global issues. It’s a fascinating and essential subject that focuses on economics, culture, education, and political science, as well as the influence they have on society. You’ll also discover how and why countries, governments, and people respond to such problems in future. It is important, especially in the professional world of international relations, to have the cognitive capacity to hold a compelling and balanced argument. Misleading information and fake media are tearing communities apart and bolstering potentially deadly ideologies. This is why we need

individuals to speak out against it and advocate for those who can't [11]. It's also crucial to keep in mind that power relations isn't only about politics. It's all about having a cross-cultural understanding and awareness of what's going on outside national borders when it comes to international relations. International strategy is important so that you can observe and comprehend where and how policies, tactics, conflicts, and laws affect people across the countries due to Arctic melting.

The Arctic has enormous mineral and energy potential. According to the Eurasia Group, "$100 billion may be invested in Arctic resource research and extraction over the next decade," as the Arctic has one-third of the world's undiscovered gas and 13% of its undiscovered oil. Renewable energy and rare earth minerals are also abundant in the Arctic. Research and extraction bring environmental concerns, such as the need for extensive preparations to deal with possible oil spills, but they will also necessitate improved search and rescue SAR skills [12]. Some Arctic experts are concerned about the Trump administration's decision to allow oil and gas drilling within the Arctic National Wildlife Refuge, citing the risk to native species and indigenous populations that rely on them. Also, melting ice offers new arctic routes, shorter transit times, and huge economic benefits, all of which will appeal to trade oriented countries like China. According to one calculation, ships travelling from Shanghai to Hamburg through the polar route may save 2,800 nautical miles compared to the usual Indian Ocean route. Russia, with China, recognizes the advantages of a more accessible Arctic [9].

The Northern Sea Route (NSR), as it is known in Moscow, runs over 3,000 kilometers and seven time zones, connecting the country's massive Arctic resources. Russia will undoubtedly seek corporate and technical partners to help build the NSR infrastructure as these rivers become more accessible. Other issues, especially for the United States, are raised by the projected increase in commercial ships — and tourist cruises. The Bering Strait, an environmentally sensitive maritime area, will be traversed by several of these routes. Furthermore, the area lacks the necessary SAR and environmental cleanup skills to deal with the expected increase in maritime traffic.

The emerging Arctic and its potential has piqued the curiosity of both old and new companies in the region. Too far, there has been substantial collaboration on all sides as a result of the Arctic Council's consensus-based approach, which has been spearheading this endeavor since 1996 [1]. Thirteen non-Arctic countries, as well as a number of intergovernmental and non-governmental organizations, are observers on the Arctic Council. The Arctic melting raises plenty of global issues. For example, how would rising polar temperatures affect global weather patterns? Therefore, the objective of our study roams around different scientific research and collaboration among Arctic nations that are increasing, and the region's and the world's ongoing, drastic change in the Multilateral world. This means that this research will take on even greater importance as decision makers discuss environmental resilience, mitigation, and adaptation measures both in the region and all around the world.

Chapter 2

2. Literature Review

2.1 Theoretical Review

The latest indicators this summer that the Arctic is rising twice as quickly as the rest of the globe include heat waves from Greece to Siberia and fires north of the Arctic Circle. As the polar ice caps

melt, this once-inhospitable part of the world is becoming the next global crisis, which will have far-reaching consequences for both Arctic and non-Arctic states, as well as for local and global habitats. However, the shifting environment, new sea routes, and potential new commercial possibilities raise concerns about global security and diplomacy [13]. Scientists predict that the Arctic Ocean will be mostly open water during the summer months over the next 2 centuries. This includes new polar routes and faster sea travel times than ever before, but it also means new potential conflict zones. Short intervals of extremely cold weather are becoming common in the Arctic, and longer intervals of milder weather in some regions. Temperatures at the world's northernmost weather station were above freezing in mid-February 2019, almost 45 degrees Fahrenheit above average. However, according to a 2018 Arctic Council report, the thickness of Arctic Ocean sea ice has decreased by more than 65 percent over the last thirty years [14]. Talking about deep waters it absorbs rather than reflects the sun's brightness. This will most likely result in higher temperatures and more melting. The Georgetown University Institute for the Study of Diplomacy organized a working group on the New Arctic and its geopolitical consequences to delve deeper into this topic. The New Arctic: Navigating the Realities, Possibilities, and Problems, published by ISD, brings together views from experts on the Arctic, climate change, foreign policy, and national security, as well as officials from government and nonprofit organizations [15].

2.2.1 The Complexity of Arctic Security

The US evacuated most of its Arctic forces and capabilities when the Cold War ended, while Russia abandoned much of its infrastructure. In a strange turn of events, Arctic melting is exposing a former Cold War U.S. nuclear weapon test facility and the radioactive waste that goes with it, offering "an absolutely unique avenue of political conflict stemming from climate change," according to the report. Western allies have grown alarmed in recent years about Russia's increased interest in the region and military buildup, which includes new Arctic airfields, deep-water ports, and an arctic force, as well as a new Arctic command. In icebreakers, Russia has a forty to two edge over the US. Similarly, China also has an Arctic strategy, as revealed in a white paper released in January 2018 which is called the "Polar Silk Road" linked to Beijing's Belt and Road Initiative. According to a Council on Foreign Relations research, China is clearly interested in new and faster transportation alternatives, but it has also invested in mining in Greenland and is attempting to negotiate a free-trade deal with Iceland, construct additional icebreakers, and expand its fishing fleets [16].

One of the most apparent and concerning aspect of anthropogenic forcing is the rapid loss of Arctic sea ice. The Arctic climate and terrain have seen remarkable changes in the last four decades, with current sea ice trends exceeding the predictions. These profound changes are in line with greenhouse gas (ghg) emission [17]. Although specific figures are difficult to predict because of significant climatic variability, climate models predict that Arctic waters will be seasonally ice-free by mid-century (Figure 4) if present emissions levels are continued.

Figure 4. Modeled Ice Extent vs Atmospheric CO2 Concentrations, 20th Century. (The figure is taken from reference number [44]).

Most significantly, by the end of the century, the great majority of sea area in the Barents, Kara, East Siberian, and Chukchi seas is projected to be ice-free at the end of this century. Aside from the impact on wildlife, Indigenous and other people societies, and global environmental systems, melting Arctic sea ice is crucial because it frees up previously closed shipping routes in the Arctic. Just as the Northern Sea Route and the Northwest Passage have lately received considerable amount of attention in international commerce and safety [18].

i.The NSR (Northern Sea Route)

The Kara, East Siberian, and Chukchi seas shape the Northern Sea Route (NSR). The passage is not defined by a single route; the NSR refers to a number of options with lengths ranging from two to three thousand nautical miles. In 1991, the NSR was accessible to international visitors for the first time. In 2009, a non-Russian bulk ship and LNG tanker made the first commercial transit, followed by a non-Russian bulk carrier and LNG tanker in 2012. The number of NSR journeys increased by 65 percent in 2013 over the previous year, although cargo increased by just 7.5 percent. Most majority of these journeys weren't exotic international maritime adventures; more than 60% of them went between two Russian ports. Despite this, yearly travels are progressively growing. Between January and April of this year, 49 boats completed 426 journeys across the Northern Sea Route. In 2018, the overall volume of traffic in the NSR was 21.2 million tons, with Russian President Vladimir Putin promising to expand this to 81 million tons by 2024 [19]. The legal validity of the NSR has always been a source of contention, but arctic melting has heightened worries about sovereignty. Because the NSR passes through Russian Federation internal waterways and territorial seas, Russia regards it as a "historically established national transport channel of the Russian Empire," and provides an authorized framework for navigation. To date, Russia has been solely involved in the development of the NSR. Many academics say that Russia's historical development efforts, as well as its unmatched experience and understanding of the area, enhance Russia's claim to authority. In practice, Russian authority has been questioned. The main obstacle to Russia's claim is conflicting interpretations of the United Nations Convention on the Law of the Sea, which was signed in 1982 [20]. (UNCLOS). The US has charged Russia of interpreting the treaty's clauses too broadly in order to impose discriminatory restrictions and limit navigation, and regularly refers to the right to "innocent passage" as an example. UNCLOS, in particular, grants some advantages and imposes limits on arctic ice-covered areas as the physical landscape of the Arctic changes, so does the interpretation and application of international law. The United States has taken the most extreme position among Arctic states, claiming that all Arctic straits are international waters and that no one state has the authority to block international vessel transit. Russian authorities respond by claiming that the legal system of the Arctic as a whole and hence the NSR is derived not just from contractual and customary law, but also from the domestic legislation of Arctic states. The Russian Federation appears to be stuck in a never-ending balancing act between defending its sovereignty and reaping the economic rewards of liberalizing the NSR. President Vladimir Putin while highlighting Russia's territorial authority stated "We intend to develop it into a major business corridor of worldwide significance. I'd want to stress that we envision it as a potential international transportation artery capable of competing with existing sea routes in terms of cost, safety, and quality [19]."

Northeast Asia and Northwest Europe Trade Bilaterally

The Suez Canal, which permits ships travelling between the global East and the global West to skip the long detour around the Cape of Good Hope, currently handles 8% of world commerce. The potential of diverting commerce through Arctic waters has been a prominent topic of discussion in economic and political contexts as ice-free conditions are anticipated for Arctic oceans by mid-century. The NSR, which connects Northeast Asia and Northwestern Europe, is expected to redirect two- thirds of commerce presently travelling through the Suez Canal. The Suez Canal connects east Asia with Europe and is approximately 21,000 kilometers long [21]. Using the NSR, this could be decreased to 12,000km, saving ten to fifteen days of trip time. It is predicted that an ice-free and operational NSR will boost global trade. This growth would be centered in Northeast Asia, with China, Japan, and South Korea expanding their trade with Western Europe by about 10% [9]. The distance between Japan and major European shipping ports in the Netherlands, United Kingdom, Germany, and Belgium would be cut by 37% if traffic was routed through the NSR rather than the Suez Canal. The distance between South Korea and China would be decreased by 31% and 23%, to the same ports [21]. Reduced shipping distances, may not always equate to lower costs. Cost reductions must be balanced against increased trade volume; western European and east Asian economies are likely to take advantage of an operational NSR and enhance bilateral trade flows between them. It is reasonable to anticipate that many nations will boost trade flows if given financial leeway by shorter transit distances, especially since Asia has surpassed North America as

the main market for European goods. It has been predicted that under fully operational conditions, Germany will expand trade with Northeast Asia by 12%, with Austria, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, Sweden, and the United Kingdom following suit [22]. Analyses assuming full NSR operation suggest that trade will be diverted, with bilateral flows increasing between Western Europe and China, Japan, and South Korea at the cost of trade with other areas. Intra-European trade, particularly between Northwestern Europe and the continent's southern and eastern regions, will decline. This economic divergence must be balanced against increased commerce with Asia.

Some nations, such as France, Spain, and Portugal, predict just a 1-3 percent growth in trade with Asia [20]. The opening of the NSR would not affect the overall trade picture for these nations since it would not compensate for the decline in intra-European trade (Table 1).

		Only NSR			both NSR & NWR	
	China	Japan	Korea	China	Japan	Korea
Germany	18.94	20.56	20.01	19.33	20.5	19.71
United Kingdom	17.2	14.48	17.09	17.28	14.45	16.76
France	6.58	14.79	9.09	7.04	14.69	8.74
Italy	1.24	8.33	4.47	1.21	8.38	4.31
Spain	5.37	8.2	4.98	4.83	8.17	4.77
Netherlands	16.73	19.39	19.17	16.98	19.16	18.7
EU27	14.51	17.33	15.01	14.39	17.24	14.7
USA	0.72	-0.09	-0.03	13.48	4.8	4.49

Table 1. Exports from East Asia with Use of NSR Versus Joint use of NSR and NWP Source, International Journal of Trade and Global Markets. (The table is taken from reference number [43]).

ii. The NWP (Northwest Passage)

Talking about the Northwest Passage, the NWP follows the coast of North America, linking the Northern Atlantic to the Pacific Ocean through the Arctic Ocean and the Canadian Archipelago's rivers. The great majority of vessels in the NWP transit across the southernmost portions of the route, where climate is more favorable; the northern parts are almost entirely used by government ships and nuclear submarines. The major threat to Canadian integrity has always been sovereignty challenges to the NWP. Canada considers the NWP to be internal seas under its authority, and the Canadian House of Commons voted in 2009 to rename the passage the Canadian.

Northwest Passage. Several, including the United States, object to this claim and demand that the NWP be officially designated as international seas with free passage for foreign and military boats. During 1985, a US National Guard icebreaker transited the Greenland- Alaska strait without first obtaining authorization from the authorities of Canada [14]. This sparked the Arctic Cooperation Agreement of 1988, which guarantees that all navigation by US icebreakers into waters claimed by Canada as internal waters shall be performed with the agreement of the Canadian government. In the early twenty-first century, when NATO extended its presence in the Arctic, it weakened Ottawa's relative clout and posed a danger to the US-Canada agreement. Such obstacles to Canada's Arctic jurisdiction have sparked fears of sovereignty, with the notion that the country is fighting to maintain its authority and is therefore vulnerable to security concerns. The Government's fear of losing its sovereignty has resulted in several regrettable actions. Talking about 1950s, the federal government moved Inuit families from Québec to the High Arctic Archipelago in order to enhance proof of occupation and sovereignty over the territory. The border conflicts between Canada and the US over the NWP have been very small if we compare their general relationship with each other. Because Canada values cooperation with US military troops

and both countries respect their bilateral economic ties, disagreements over the Arctic route have had minimal influence on the two North American countries' cooperative relationship or the Arctic Council's stability [13].

East Asia and the United States Trade Bilaterally

The Northwest Passage may be used as a detour to the Panama Canal (Figure 5), however the distance saved would be little. The most significant rise in commerce between the US and Northeast Asia, notably with China, would result from the opening of the NWP.

Figure 5. The Northwest Passage vs. Panama Canal Source, International Journal of Trade and Global Markets. (The figure is taken from reference number [43]).

The major distinction between a case in which only the NSR is used and one in which both Arctic sea shipping are fully operational is the huge rise in US shipments to China. The NWP would catalyze a thirteen percent rise in bilateral trade flows between the US and China, compared to a minimal increase of less than one percent when just the NSR is available. An unrestricted NWP would solely effect the European continent in the sense that it would lessen trade diversion induced by the opening of the NSR. Because this economic diversion was already small, the opening of the NWP has little to gain and little to lose for European nations. The NWP is less significant to the future of Arctic shipping than the NSR because to its distant location and harsh circumstances. Despite the absence of evidence, the prevailing assumption is that the NWP will never be competitive with the NSR or other conventional trading channels [23].

2.2 Conceptual Framework

2.2.1 Examination Of The Future Struggles That Countries Will Face

i.China

With regards to Arctic shipping, the full operation of the NWP and the NSR will benefit the Chinese economy most. The economy of China is heavily reliant on international shipping, with international commerce accounting for 46% of GDP [24]. It is estimated that diverting commerce through the NSR may save China

$60-120 billion per year, thus the Chinese motivation to build Arctic sea routes is significant. To have unrestricted access to the NSR and NWP for all governments China has consistently campaigned using UNCLOS terminology to claim that the Arctic is the "shared inheritance of all humanity [24]." According to the UN Convention on the Law of the Sea, foreign boats are given "innocent passage" across territorial seas and free navigation through exclusive economic zones, although governments retain complete authority over internal waterways.

The lack of Arctic territory undermines China's ambitions in the face of requests and concerns from the Arctic Eight: Canada, Russia, the United States, Denmark, Sweden, Finland, and Norway. The biggest problem to Chinese ambitions in the Arctic is a lack of authority in the region. Although China is clearly and rapidly increasing political and economic clout across the world. Chinese officials and affiliates have attempted different methods of creating a position of authority and legitimizing their claims to Arctic issues as the potential of open Arctic routes becomes a regular topic of debate in political and commercial arenas. The Chinese have been fighting a never-ending battle. China was refused diplomatic recognition on the Arctic Council three times before

eventually being granted it in 2013 [16]. Even yet, the Asian nation has limited influence on Arctic affairs. China has taken many efforts to overcome this deficit. But what China lacks in political power, has compensated through technological and economic diplomacy. Since the 1990s, China has maintained a well-funded and extensive research infrastructure in the Arctic area. The Ice Silk Road programmed, part of China's One Belt, One Road global economic plan, is in charge of study and investigation into the role of northern sea lanes and railroads in the extension of China's commercial ties [25]. In addition to 2004, China constructed a permanent facility, the Polar Research Institute of China, in Norway's Svalbard archipelago. China continues to build connections with the Arctic Eight through collaborative global warming and environmental research, and it routinely participates in different forums such as the Arctic Science Summit Week and the International Polar Year Programme [21].

China hoping to gain favor with the Arctic nation by becoming the region's major commercial partner and foreign investor. The Silk Road Fund and the China National Petroleum Corporation (CNPC) have major holdings in Russia's Yamal LNG project, extending China's Arctic investments beyond North America. Despite the Arctic Eight's dominance, China is undeniably emerging as a significant participant in the Arctic area. Although China's engagement in the Arctic has been regarded with some skepticism in the past, it is no longer controversial to assert that, as a major source of foreign investment, Chinese aspirations are becoming relevant to Arctic politics. The Arctic is becoming the most significant element of China's imperialistic aspirations in both hard and soft terms, and it has played a key role in strengthening commercial ties with Russia and Canada in the twenty-first century [26] (Figure 6) (Table 2).

Figure 6. Breakdown of Russian Energy Exports to China in US $bn. Source, Federal Custom Service of the Russian Federation, from The Oxford Institute for Energy Studies. (The figure is taken from reference number [46]).

	China		Japan		South Korea	
	Exports	Imports	Exports	Imports	Exports	Imports
Austria	12.64	10.36	10.97	17.1	8.95	11.78
Belgium	12.34	11.28	15.82	10.82	14.69	11.86
Bulgaria	-1.71	0.69	-0.81	0.41	-1.25	0.16
Croatia	-1.29	0.57	-1.18	-0.01	-0.8	0.2
Czech Republic	8.17	15.44	15.15	18.6	10.49	18.51
Denmark	11.43	9.39	2.64	11.31	5.76	9.19
Estonia	10.75	12.03	9.31	14.55	11.73	6.19
Finland	10.98	6.91	11.77	16.03	10.44	12.49
France	1.51	3.41	9.17	7.81	4.18	6.46
Germany	10.53	10.37	13.88	11.54	7.07	12.58
Greece	-0.99	0.49	-0.45	0.27	-0.72	0.16
Hungary	-2.08	0.5	-1.44	1.09	-1.38	0.89
Ireland	6.56	6.99	3.64	11.78	18.68	8.9
Italy	-1.42	0.97	-1.06	0.17	-0.87	0.3
Latvia	11.37	14.31	5.59	10.34	11.26	11.67
Lithuania	11.03	10.07	9.18	11.36	12.91	7
Netherlands	10.62	9.4	14.96	12.98	13.18	12.79
Poland	11.02	13.51	13.64	16.71	9.87	14.71
Portugal	-0.6	0.89	3.16	3.7	3.76	1.36
Romania	-1.79	0.77	-1.25	0.26	-1.25	0.25
Slovakia	7.68	6.06	14.37	9.15	9.66	14.64
Slovenia	-1.59	1.18	-1.05	0.5	-0.82	0.86
Spain	-0.64	0.99	5.5	4.61	1.97	2.12

Sweden	12.7	10.53	13.37	17.97	9.95	12.02
United Kingdom	12.33	8.23	12.3	7.77	7.95	8.98
Eu28	6.72	7.48	10.23	9.01	6.49	8.62
Norway	12.63	12.93	12.91	13.2	5.19	10.43
Turkey	-1.31	0.4	-1.03	0.32	-0.81	0.14
United States	-0.72	0.46	-0.58	0.14	-0.3	0.06

Table 2. Changes in trade values for Northeast Asia under use of the NSR; Source, CPB Netherlands Bureau for Economic Policy Analysis. (The table is taken from reference number [45]).

ii. Russia

As per the Russian Ministry of Natural Resources and Environment, the Russian Arctic coast has the potential of eighty billion tons of oil, with the Barents and Kara seas accounting for 80% of the total. Coastal minerals are becoming more viable as sea ice coverage decreases. Arctic melting may disclose up to two trillion cubic feet of natural gas and hundred billion barrels of oil, according to estimates. President Vladimir Putin and other Russian authorities have expressed their aim to turn the Russian Arctic into a “resource base of the twenty-first century” in light of increasingly available offshore resources [24]. In 2009, Russia established its first comprehensive Arctic policy. It highlighted the significance of its Arctic regions–the Barents, Pechora, and Kara seas, as well as the Yamal peninsula–and the “Russian Federation’s Transport Strategy for the Period Until 2030” emphasized the development of the NSR as a means of improving Northern Russia’s socioeconomic development [16]. When Russia approved the “Russian Strategy for the Development of the Arctic Zone and the Provision of National Security through 2020” in 2013, the same goals were outlined. These are only two of numerous government actions that demonstrate Russia’s intense desire to improve geological exploration on its continental shelf, undertake large-scale resource projects, and build transportation infrastructure. Russia has repetitively decided to seek and reasserted territorial claims to Arctic waters under UNCLOS, stating that the Arctic is “home” to Russia and other Arctic nations, and that the Arctic Council is responsible for defining the “game rules” where any country trying to develop the Arctic must comply [20]. Locally, the Russian government has passed laws that allows a small group of state-owned businesses to dominate natural resource extraction in Russia’s Arctic. Talking about Russia’s first thorough Arctic policy, modifications to Russia’s Law on Subsoil Resources were made in 2008, limiting access to shelf deposits to businesses with more than fifty percent state ownership and at least five years of offshore exploration experience. These essentially limited eligibility to only two entities: Gazprom and Rosneft, both of which are significant state-owned enterprises. Whereas international firms may still engage in the development of the Arctic border, new legislation required them to do so in collaboration either with Gazprom or Rosneft [19].

Some democrat state leaders have spoken out against this. The Minister of Natural Resources and Environment have frequently stated that concentrating licenses in state-owned businesses stymies Arctic development. The Authority of Environment And natural Resources tried to postpone the issuance of new licenses by promoting a development programme that would broaden suitability. When top executives from Gazprom and Rosneft approached Putin, the President requested that the licenses be issued immediately. State-owned businesses had been given licenses covering 80% of the Russian Arctic shelf by 2013. Considering the rights provided to government businesses, Gazprom and Rosneft lacked the offshore knowledge and resources required to develop the Russian Arctic shelf on their own, and have mostly failed to deliver at projected levels [27].

iii. Norway

Russia’s Arctic policy is the most explicit and consistent among Arctic nations: attract Chinese investments, extend marine exploration, and solidify the Russian Arctic into natural resources. The techniques used by other Arctic states to Arctic hydrocarbon resources are less simple. Norway, for

example, is torn between rising issues about climate change, preserving national production, and Russian pressure. Many business executives were disappointed when Norway's Labor Party withdrew exploration and drilling off the Arctic Lofoten islands in April 2019 [28]. Norway's national fund declared a month before this contentious judgement that it would no longer participate in 134 businesses that search for oil and gas, but would keep shares in major corporations like BP and Shell that have renewable energy units.

This news follows the Norwegian government's approval of the one trillion dollar oil fund-the world's largest sovereign wealth fund–to invest in renewable energy projects not listed on the stock market, in an effort to transfer money generated by fossil fuels to more renewable sources of energy [29]. This reflects concerns for the Norwegian economy and climatic conditions in the long run, as well as growing doubts about the oil and gas industry's long-term viability both environmentally and economically as calls for climate action reverberate across the country and renewable alternatives become more appealing. The bad effect of unethical oil and gas development had a huge amount of environmental affect in Nigeria [30]. However, the energy landscape in Norway is far from green.

Despite oil and gas contributing for more than half of total national exports, initiatives by the government to reduce hydrocarbon production face stiff opposition from the local sector. In light of the Labor Party's recent judgement against drilling off the Lofoten islands, Norway's largest producer, state-controlled Equinor ASA, and the Norwegian Oil and Gas Association have voiced antagonism and concerns about the industry's stability. Industry Energy, the country's largest oil union and a long-time Labor Party supporter, slammed the new drilling policy. Although present research has mostly been limited to the southern Barents Sea, Russian drilling along the territorial waters has reignited Norwegian interest in the sea's Arctic potential. Norway will ready to claim its share of oil and gas if Russian drilling along the Barents border proves productive, according to the director of the Norwegian Petroleum Directorate (NPD) (Figure 7).

Figure 7. Arctic Nations Highlighted Among the Top Fifteen Global Exporters of Oil. Source, Daniel Workman, World's Top Exports. (The figure is taken from reference number [43]).

Norway has taken a "balanced" approach to Arctic melting and resulted in availability of resources, enacting carbon levies and investing in emissions- reduction technology while continuing to exploit Arctic hydrocarbons and maintain its oil production heritage. Norway is heading toward a more sustainable energy sector, more than its Russian neighbor. However, with the Russians having set an indisputably low bar, there is little reason for jubilation. Sustainable policy concessions, such as coal divestment, skirt around the Norwegian oil industry's colossal beast. Green technology investments and coal divestments serve as a diversion, while the oil sector proceeds the business as normal behind the doors. Norway, which is Europe's top crude oil exporter, has a long way to go before it can legitimately proclaim itself a sustainable economy.

iV. Canada

The Canadian government, like Norway's, is struggling with how to reconcile the looming threat of climate change with its economic reliance on fossil fuel exports. The Canadian government, like Norway's, is struggling with how to reconcile the looming threat of climate change with its economic reliance on fossil fuel exports. Similar to Norway, Canada's oil and gas policies result in a mixed blessing. The government's attitude towards the Arctic, in particular, is unclear. The Canadian government imposed a five-year embargo on offshore drilling in the Arctic in 2016. Canada has same financial and logistical challenges as Russia when it comes to offshore drilling: high actual and opportunity costs, unpredictability, adverse weather conditions, and an urgent need for international infrastructural support. Having ample resources in much less expensive and inefficient locations on the west coast, mounting local and international pressure to take more severe climate-change measures, and volatile oil prices on the global market, Arctic offshore

drilling is seen as a high-risk, reduced venture. Oil and gas development in the Arctic had been decreasing for several years previous to the federal embargo. Imperial Oil Ltd and Royal Dutch Shell have also ended joint ventures that would have allowed oil to be transported across Canada's Arctic territory [31].

As Canada has adopted a more forceful and rigid approach to Arctic resource extraction than some of its European counterparts, the Arctic nation's shift to a renewable energy economy is no minor achievement- the fossil fuel sector in Canada has yet to capitulate. In case, if Norway and Russia continue to expand Arctic extraction, and Canada's economy becomes less competitive, the rationale of the ban, which is set to be reviewed in 2021 by a presumably new administration, may be put into consideration. The Canadian government, like Norway, faces a fundamental difficulty in combining ever-increasing environmental concerns with its economic reliance on fossil fuel extraction.

V. USA

Former President Barack Obama announced the same embargo on offshore drilling in the Arctic as Canadian Prime Minister Justin Trudeau at the Arctic Oil & Gas Symposium in Calgary in 2016 [32]. President Trump has lately sought to overturn the moratorium and begin drilling in the Arctic of Alaska. President Trump has lately sought to overturn the moratorium and begin drilling in the Arctic of Alaska. A federal court in Alaska found that removing such a restriction was outside presidential power, and that Trump's decision to do so was unconstitutional. Considering this legal stumbling block, it would not be unexpected if Trump was able to get over technicalities and begin Arctic drilling, thus undoing another Obama- era climate regulation. Aside from the Arctic drilling moratorium, Trudeau has stated a goal to lessen Canada's reliance on the United States as a fossil fuel consumer and expand supplies to new Asian markets.

It's uncertain whether the US government will be motivated to increase its Arctic offshore presence, become more competitive with Canadian exports, and diversify its energy market as a result of potential rollbacks by its largest trading partner. Relying on Trump's infamous global warming skepticism and backing for extractive sectors, the latter scenario appears to be more plausible. The future of American Arctic offshore drilling is uncertain due to legal challenges. Considering the government's general disregard for climate change problems and the possible anxiety generated by Russia's coastal growth, continued development of American Arctic hydrocarbons is unsurprising-legal obstacles may offer, at most, a severe recession [32].

Chapter 3

2. Hypothesis

2.1 Theoretical Explanation

So, how the melting of the Arctic change the pre- existing multilateral world order? Conflict in the Arctic is considerably more likely to arise as a result of spillage from reasons specific to the region itself. Arctic stability is intrinsically tied to larger security concerns, and it should be treated as a constituent issue within the national security framework. It's important to note that "the Arctic" refers to a climatic rather than a political region, admitting its fragmentation in that each Arctic territory is vulnerable to its national government's distinct political decisions and ties. International conflicts with Russia following the lifting of Sanctions, or strained ties with a politically radical United States, are more likely to become the foundations of war than simply regional disputes over

controlling territory, to provide two hypothetical instances. However this is the more plausible option, it is still improbable, and much less so if it happens at the same time that Arctic ice melts. The Arctic Council has proactively and regularly emphasized its commitment to cooperative and peaceful ties among Arctic governments, both as individuals and as a cohesive body [33].

The Arctic Council's ideas on collaboration have traditionally brought Arctic nations together, and they have a track record of sticking to peaceful settlement attempts. Because of the absence of motivation for confrontation and the history of cooperation, there is a very low chance of Arctic conflicts and security concerns. When talking about offshore development, it's common to bring up the possibility of conflict in the Arctic. In reality, there is scant evidence of a link between Arctic offshore oil and gas and international warfare. There is a widespread misconception that offshore resources go unclaimed and unaccounted for because of defined border lines. In actuality, about 90% of polar regions oil and gas is found in the Arctic states' Exclusive Economic Zones or territory, and so comes under the authority of coastal governments [31]. Extremely harsh weather conditions and significant actual and opportunity costs protect the remaining ten percent, so there's no motivation to fight over territorial claims to natural resources. This should be enough to dispel fears of an impending conflict: there is no unclaimed Arctic wealth to be fought over. As a result, the answer to research about a potential breakout of conflict over oil and gas resources is straightforward: it is very improbable.

3.2 Statistical Hypothesis Testing

3.2.1 Hypothesis 1 (H1): How Russia Benefit the Most from the Arctic Melting due to its Geographical Location

Russia has discreetly expanded its political, economic, and military power in an area that is less critiqued: the Arctic, while the rest of the world is focused on trade battles and shifting geopolitical dynamics. According to the Arctic Institute, a center for circumpolar security research, Russia's coastline accounts for 53 percent of Arctic Ocean shoreline, and the country's population in the region totals about two million people, or roughly half of the people living in the Arctic worldwide. It's probably predictable that Russia wants to expand its dominance in a region where it feels at ease and where there are several prospects in areas such as oil and trade, as well as defense. Russia is the largest Arctic country due to its geographic location. The truth that two million Russians living there also implies that the Arctic belongs to Russia. People are drawn to the Arctic because it contains so many of their resources, including oil and gas, different type of minerals and fisheries." There might be trillions of dollars up to $35 trillion in the form of undiscovered gas and oil deposits, as well as mineral riches, that Russia can take benefit from and its Arctic neighbors are eager to exploit. Russia can benefit economically from the Arctic, and it has long been a driving force behind large-scale projects like the Yamal LNG project which has 20% stake, and which Total describes as "one of the world's largest and most complex LNG (liquefied natural gas) projects," based on the Yamal Peninsula above the Arctic Circle. Russia's 2nd biggest natural gas producer 'Novatek' owns a 50% interest in the company. In October, the Kremlin promised a trillion-ruble tax break, or around $40 billion, to encourage energy corporations to expand exploration and extraction activities in the Arctic [27]. Domestic and foreign investors allegedly stated that they would only participate in Vostok Oil, an Arctic oil project managed by Russia's largest oil giant Rosneft, provided the government agreed to Rosneft's chief executive's demands for favorable tax rates. According to Reuter, Vostok Oil may generate up to 100 million tons of oil per year, or a fifth of what Russia now produces. However, the Arctic is vital to Russia for reasons other than resources; it has enormous economic, defensive, and transportation importance. It has both psychological and patriotic significance. The economy is anticipated to expand 1.2 percent in 2019, 1.6 percent in2020, and 1.8 percent in 2021, according to the World Bank's projection released earlier this month. Experts believe that the cost benefit analysis of expanding into the Arctic, a location where the inhospitable climate swiftly raises operations expenses, should be carefully

considered. The Northeast Passage or Northern Sea Route (NSR), a once unreachable sea route in the Russian Arctic that Russia perceives as a potential shipping in the future to transmit goods and resources among Asia and Europe as arctic ice melts, it is one of the project that has both economic and symbolic significance for Russia. It's no surprise that other Arctic nations, including Canada, Denmark, Greenland, Finland, Iceland, Norway, Sweden, Russia, and the United States, are interested in developing their own Arctic infrastructure and resources within their own territories, given the Arctic's apparent abundance of resources, albeit difficult and expensive to extract. Studies pointed out that Russia's Arctic infrastructure is better established since it has more long-standing towns, communities, and investment there, such as Murmansk and Norilsk. Considering different degrees of rivalry and military conflicts in the Arctic, there are attempts at coordination and collaboration among Arctic governments, albeit hesitantly at times.

3.2.2 Hypothesis 2 (H2): How China and Russia Come Out of the Race as the Most Advantageous

China authored its very own Arctic Strategy in January 2018, outlining its interests in the area, and it has been increasingly investing in Arctic transportation and services projects, such as the previously mentioned Yamal LNG project, in which its Silk Road Fund, a government investment initiative, owns a 9.9 percent stake, rendering it the project's biggest foreign stockholder. Russia has welcomed Chinese investment, urging the People's Republic of China to help build an Ice Silk Road, or Polar Silk Road, in late 2017, which is basically another strand of China's Belt and Road Initiative mega economic development project (Figure 5). In Iceland and Norway, China has also invested in research stations, and announced that it will work with Russia on a research facility to predict ice melting and its conditions in the Arctic. Also it launched the very first arctic research ship, the icebreaker Xuelong or Snow Dragon 2, last year, which can crack through 1.5 m of ice.

It is now developing a nuclear-powered icebreaker, similar to Russia, which debuted its own, the Ural, in May. According to Reuters, the icebreaker would be one of three controlled by Russia's state-owned nuclear energy firm Rosatom. The Ural and its sister ships are critical to our long-term plan to open the Northern Sea Route to year-round traffic. In recent years, Russia and China have expanded their strategic as well as geopolitical relations in a variety of sectors, none more so than in the Arctic, where both aim to take use of the Northern Sea Route for economic purposes. However, the United States is concerned about China's growing presence in the area.

Two major causes have fueled Russia's growing cooperation with China. Firstly, the Ukraine issue has heightened political turmoil between Russia and the West, with Russia pursuing a political goal of demonstrating its independence from Western states. Secondly, important players in Russia's oil and gas industry lack what China seeks: investment and a diverse energy market. China has unquestionably complied with Russia's ambition to move eastward. CNPC supplied $25 billion in loans to Russian oil businesses in 2009, mostly to fund the building of the Eastern Siberia Pacific Ocean oil pipeline, which carries oil from Russia to Daqing, China [27]. China was compensated with 300 million tons of oil by Rosneft. Rosneft and Sinopec reached a deal in 2013, for the sale of 10 million tons of oil per year for ten years in return for $85 billion.

Considering China's focus on developing the Russian Arctic, the Russian government is apprehensive of Chinese development and frightened of China becoming too powerful in some regions of the country. Along with their increasing partnership, the Russian government has taken steps to limit China's power in Arctic offshore drilling and prevent it from entering vital Russian economic sectors. Despite the fact that China has no territorial claim to the Arctic but China has the potential to revolutionize the struggle for resources and power in the world. With its rising economic and political power, China has begun to fund Arctic development projects despite the fact that it does not have any territory there, highlighting the region's growing global importance [28].

Aside from environmental problems, one unintended effect of a melting Arctic is an increase in

human activity. Commercial and scientific traffic, as well as military presence and activity, have increased. The receding sea ice, in particular, signals the loss of a natural barrier that has traditionally safeguarded Russia's northern frontier, leading the country's military to strengthen its capabilities. The possibility of tensions escalating exists in a New Arctic with increasing strategic and commercial importance we can say that China and Russia come out of the race as the most advantageous due to their strategic and economic value, also boosting their military presence in the Arctic Circle.

3.2.3 Hypothesis 3 (H3): How Arctic Affect NATO Relations, with US Being the Predominant Power in the Region

The Arctic has had a series of unwelcome awakening calls concerning security in the region during the last year. The topic of whether the Arctic might be considered as a battlefield for military conflict has resurfaced after more than two decades of the Far North being largely regarded as detached from 'traditional' hard strategic considerations. The Arctic has been regarded as a region of "high north, low tension" for several decades. The last president of the Soviet Union, Mikhail Gorbachev, gave a historic address in which he advocated for peacebuilding steps to reduce strategic tensions in the Arctic. In 1996, the Arctic Council, which had just been formed, opted to keep security issues off its agenda in its founding declaration [12].

The eight members of the Arctic Council, Canada, Denmark, Finland, Iceland, Norway, Sweden, Russia, and the United States, wanted to promote the Arctic as a zone of cooperation and cooperative problem-solving.

while acknowledging the Far North's particular terrain, population, and economy. Considering softening ties between Russia and the United States since the commencement of the crisis in Ukraine in 2014, the membership has an unspoken agreement to keep non-Arctic political and security concerns as a result of the Council's debates and overall Arctic diplomacy. However, due to two key causes, the situation has quickly changed. The first is the more obvious spillover of opposing great power policies into the Arctic, particularly between Russia and the US, as both nations see the region as more vital to their national interests [12]. As China could be at the forefront of this movement, other non-Arctic nations have also attempted to build more significant Arctic policy interests. Japan, Singapore, South Korea, as well as France, Germany, Italy, the Netherlands, Poland, and the United Kingdom, as well as the European Union as a whole, are among these countries. Which resulted in moving the Arctic further away from the international strategic perimeter, addressing the issue of whether the Arctic should be seen as a worldwide security concern rather than a regional one.

On a number of fronts, the US and NATO allies had responded to these operations. Improvements to the US Navy's Second Fleet, such as developing the means to operate more visibly in the Arctic; the US renovating and using facilities in Keflavik, Iceland, after American forces withdrew in 2006 [28]. The long-delayed plans for the building of new icebreakers to replace the two old boats currently in use by the US Coast Guard are nearing completion. From the acquisition of Alaska from Russia in 1867 to the present, the United States has been a pioneer in fostering diplomatic collaboration, peace, stability, and environmental stewardship in the Arctic, to the establishment of the Arctic Council in 1996 and the start of the United States' presidency of the Council in 2015 [32].

According to a recent scientific assessment of fast changes in the Arctic, sustained U.S. leadership and collaboration in the region might be critical to the country's economic success and national security. The Arctic Monitoring and Assessment Program, or AMAP, determines with much more certainty than previously that fast warming is occurring in the Arctic and Arctic climate change is altering the region, with more significant global economic, security, and environmental consequences than previously projected (Figure 8).

Figure 8. Mean Global, Arctic, and Winter Arctic Temperatures Projected until 2100. Source, Science Direct. (The figure is taken from reference number [43]).

Even though the new US presidential administration has shed light on the country's future direction, the diplomatic benefits of continuing US leadership in the Arctic have never more apparent. The United States has been a reliable source of diplomacy and cooperation among the eight Arctic nations. The United States reached major bilateral agreements with Arctic nations, including joint presidential statements on Arctic protection from the United States and Canada, as well as joint presidential statements from the Nordic countries, reducing climate change and supporting regional sustainable development [12]. As per foreign policy and security analysts, the United States' diplomatic leadership and participation in the Arctic is more important than ever as the region heats quickly. In March, an independent Task Force at the Center of Global Affairs issued a study concluding that adapting to changing circumstances in the Arctic requires a collaborative strategy and that no single country can manage the region. A melting Arctic, for example, may lead to more disputes among countries which will affect NATO relations as the region's economic prospects grow. Historically, the United States has been a strong supporter of peaceful diplomatic solutions to these sorts of conflicts. With fast developments in the area, continuing US Arctic Council participation and leadership in finding peaceful solutions to regional issues when they occur will become even more critical to sustaining global security [34].

Chapter 4

4. Methodology

4.1 Research Design

Our research highlighted the impact of Arctic Melting examining the current struggles and the future struggles that countries will have, when trying to claim the territory of the melting arctic and the resources which can be found as the ice melts away. Moreover, how the melting of the arctic open up a whole new series of trade routes, which different countries such are already trying to gain control of. Climate variations were compared to present temperature changes in the Arctic in several researches used here. Changes in Arctic sea ice, land ice, and permafrost are typically viewed as independent concerns, yet they all impact each other and the rest of the world, according to scientists. And how the loss of sea ice exposes larger areas of darker ocean water, which absorbs more solar energy than white sea ice, according to the National Oceanic and Atmospheric Administration.

The methodological framework is outlined in this part, and it is used to gather and analyze data in order to establish the purposes and objectives of this study on assessing the impact of Arctic melting in the predominantly multilateral world system. In addition, the sort of research, as well as the research approach and strategy, will be specified. Following that, we will discuss the data collecting method and data analysis, as well as the study's validity and reliability. In addition to this, this research will provide a brief explanation of why the survey and case study methods were chosen for this research article. In addition to this, this research will provide a brief explanation of why the secondary analysis method is chosen for this research article. To test our hypotheses, we used an experimental research method. In this experimental approach the study covers a number of scenarios in which the independent variables are systematically modified, as well as the relationship between different countries.

4.2 Research Philosophy

The study that has been performed here is exploratory in nature, since it has been focused on exploring the current and future challenges that countries will face when seeking to claim the territory of the melting arctic and the resources that may be found when the ice melts away. The overall goal of this study was to obtain a more comprehensive and understandable understanding of how to examine and analyze the impact of Arctic melting, as well as propose methods to further that understanding. According to Zikmund, exploratory research is the first step of a research project that describes and characterizes the concept of a problem or issue. It's ideal for clarifying one's knowledge of a specific problem. However, exploratory research does not provide definitive proof or a conclusive approach; in order to obtain conclusive proof, other research procedures are necessary.

This study is also descriptive in nature. A description of how different countries are affecting from Arctic melting. Furthermore, how past studies depicted the Impact of Arctic Melting in the Predominantly Multilateral World System has been considered in order to offer the research with a theoretical framework through which different scenarios may be investigated. Descriptive study is to depict how arctic melting is opening new routes for traders and which country is benefiting most from it. Descriptive research is predicated on a prior understanding of the core of the problem. It differs from exploratory research in that if descriptive research occurs, we will, in general, uncover answers to questions beginning with who, what, where, how, and when. Because it is an underlying study, the research is exploratory in nature, and the research's foundation is yet unknown. A little portion of this study is descriptive in nature since identity can be approximated in light of hypotheses to determine how they could apply. As a result, we may draw attention to actions that are suited for this specific case. As a result, this study is both exploratory and descriptive.

4.3 Research Approach

For research, there are two approaches: qualitative and quantitative. Our research approach would be qualitative since in qualitative research, the evaluation is held for a thorough understanding of the case. Because the outcomes in our hypothesis are not measurable in terms of how many and how much, the exploratory technique is appropriate for our instance. This expansion is primarily due to the increasing challenges between the country as the result of Arctic melting, as our primary research questions revolve around how and in what way will the melting of the Arctic change country relations? In this regard, a qualitative study might be quite beneficial. The major goal of qualitative research is to obtain a better understanding of the study from start to finish, rather than estimating. The purpose of this method is to describe a situation related to the research problem.

In addition, there are two methods for doing research: induction and deduction. The deductive approach is used when the study begins with the development of theory and hypothesis, followed by research design and technique. In this study, we developed a framework based on current theories, from which the data was evaluated. As a result, a deductive method is used in this research.

4.4 Research Strategy

Experiments, surveys, histories, case studies, and archival analysis are the five major research methodologies. Yin (1994) agrees with these five research techniques and shows that an experimental methodology is suited for a research question such as 'How?' or 'Why?' The research topic here also begins with how we used the histories and research papers study technique to develop our hypothesis. In this paper, two techniques were used:

4.4.1 Journal Articles

Journal articles are smaller than books and focus on a narrow range of subjects. A journal is a compilation of articles published on a regular basis throughout the year (much like a magazine). Journal articles are produced by professionals, for experts, and they provide the latest research.

For the research some peer-reviewed articles have been taken.

4.4.2 Research Papers

A research paper is an essay in which you describe what you've discovered after thoroughly researching your topic. From research papers, the data has been included from a variety of sources, such as books, journals, interviews, and websites.

4.5 Data Collection

The collection of data is required to answer the research questions. The variety of data is crucial in answering the study questions. This might be accomplished in one of two ways: using primary data or secondary data. Secondary data not only assists in answering questions, but it also assists in better understanding and clarification of the proposed study. When secondary sources are unavailable, the researcher is forced to rely on primary data, often known as empirical research. We conducted our investigation using secondary data. Secondary data would be gathered from peer reviewed publications, diaries, novels, previous theses, and government distributions relevant to our topic.

4.6 Analysis Of Data

Data presentation, data reduction, and conclusion formulation and verification are the three elements of qualitative data analysis. The major problem in data reduction is assembling and concentrating the obtained data in order to derive the appropriate conclusion. The presentation of data assists in going ahead depending on the outcomes obtained. The findings were vague and confusing at the start of the data collection process, but as we progressed, they grew clearer, leading to the needed thesis results. The reliability, durability, and conformability of the findings obtained from the entire method must be continually verified. Since the results of the online surveys have been received. Here's how the researchers decipher qualitative data: by looking at the proper solutions and focusing on their top examination questions and summary objectives, we can figure out the calculations and make decisions.

Chapter 5

5. Data Analysis and It's Findings

5.1 Research Findings

Collaboration in the Arctic is essential at a time when many things are changing. The different security threats are becoming increasingly linked and transnational. Handling the region's existing and upcoming security problems would necessitate collaboration. In order to enhance understanding of Arctic security and sustain peace and cooperation in the region, this section provides a variety of topics for future interaction from a policy and research viewpoint. It will be important to develop a venue to debate military security problems in the Arctic area in order to handle rising tensions and avoid geopolitical gridlock in current Arctic organizations. The Arctic Chiefs of Defense Staff meetings, which Canada convened in 2012, were viewed as a successful attempt to build such a platform. Following the war in Ukraine and the cessation of military-to-military cooperation with Russia, these were halted. Another prospective forum is the Arctic

Security Forces Roundtable, a US European Command effort that brings together military specialists and defense departments from the eight Arctic states, as well as France, Germany, the Netherlands, and the United Kingdom. Russia, on the other hand, has been barred from taking part in this endeavor. On the other hand, closing lines of communication on hard security, is not a solution to the region's problems. The absence of Russia from the table when it comes to Arctic security, on the other hand, increases the dangers and uncertainties. The Arctic states must look into re-establishing venues for military- to-military interactions in order to begin conversations on problems [1].

Natural calamities know no limits. The resources required to respond to emergencies in the Arctic are limited and frequently dispersed across large distances and state borders. Collaboration on Arctic safety problems, such as search and rescue and catastrophe management and response, has proven to be a successful example of cross-border cooperation and effective trust-and confidence-building. It is consequently critical that the Arctic governments maintain their efforts in the Arctic Council and the BEAC along these lines of cooperation. Collaboration in the Arctic Coast Guard Forum might eventually lead to cooperation in law enforcement and marine policing. Including new players in combined search and rescue drills, such as the International Committee of the Red Cross. An excellent example is the Arctic Council's facilitation of improved meteorological cooperation in the Arctic. People living in the Arctic, marine safety and security, and the supply of climatic oceanographic information, among other things, have benefited from improved meteorological cooperation. There are still unresolved issues that may be tackled and progressed for future collaboration [35].

Communities living in the Arctic should self-articulate and identify security concerns. Despite the fact that the Arctic nations have made great progress in engaging indigenous people in conversation and incorporating them in regional venues for debating indigenous problems, indigenous perspectives are rarely heard when the governments debate security. Indigenous peoples are particularly sensitive to problems of sovereignty and boundaries due to historical causes; therefore it is critical to involve indigenous peoples' representatives in talks about these issues. Indigenous peoples have a special understanding of the Arctic. They are prepared to cooperate in security conversations and be a part of the solution.

Contact between people has always been a key component of Arctic cooperation. In these times of rising global tensions, and particularly in the Arctic area, it is critical to strengthen this sort of cross-border regional interaction. Building trust between cultures, communities, and nations requires continued collaboration and more people to people interaction.

To break through the silos in the study of Arctic security, multidisciplinary research is required. New players, including as business, humanitarian groups, and insurance firms, will contribute to a better understanding of the region's security problems. The implications of growing human and economic activity in the Arctic on food, water, and health security demand more investigation. The absence of study on developing issues and possibilities connected to the usage of technology in the Arctic is one existing knowledge gap. It'll be crucial to keep looking at the consequences of geopolitical tensions for Arctic cooperation. It will be essential to consider not only Russia's military actions in the Arctic, but also Western and NATO activities, as well as the threats that these activities may pose to the area. To understand the possible benefits and drawbacks of establishing a hard security forum for the Arctic, an analysis of existing and potential venues for hard security debates will be required. One method to enhance understanding and establish risk mitigation techniques would be to do scenario-based research on the consequences of great power competition in the Arctic [35].

Discussion

The Arctic is meting twice as fast as the rest of the world. The twenty-first century has seen record

high temperatures and record low ice coverage, with the previous twelve years seeing the lowest minimum sea ice extents in global history. Although periodic variation and oscillation patterns intrinsic to the Arctic climate system might explain some of the reduction in sea ice, current data are both outside the natural Arctic climate's known limitations and compatible with human climate change. Ice sheet loss is concerning not only for the Arctic environment, but also for global stability and regulation. The Arctic, with its comparatively high albedo, acts as a thermostat for the rest of the globe, thus disrupting Arctic climate systems means jeopardizing global climatic stability. Climate projections indicate that by the end of the century, the Arctic will be totally ice-free. Although projections range on specific dates, the general agreement is that an ice-free summer will arrive towards the end of the century [32].

As the ice melts, new political, economic, and environmental opportunities and threats emerge. The future of trade, as well as the prospect of newly accessible shipping routes consisting of Arctic seas, is one of the most prominent topics of discussion sparked by melting sea ice. The Northern Sea Route, which runs across Russian territory and links northeast Asia and northwest Europe, has long been a popular travel route. The NSR would cut travel lengths by approximately half when compared to the Suez Canal, which is currently in use. This would result in slight trade diversion from smaller European nations by increasing bilateral trade flows between Japan, South Korea, and China and large western European centers. Gains from trade through the NSR, on the other hand, are dependent on a number of factors that are mostly unknown [36].

Weather that is unpredictable and unfriendly, the Russian monopoly on transit costs, and high insurance premiums, and one of the most significant impediments to making the NSR commercially viable is a severe lack of infrastructure. Regardless of how these issues are resolved, using the NSR will not be profitable. As sea ice coverage decreases, another trading route, the Northwest Passage, may become open. The NWP would be a viable alternative to the Panama Canal since it would pass across the Canadian Archipelago.

The potential distance reductions from the NWP are considerably less impressive than those from the NSR, making it a less appealing shipping route. The NWP, when combined with a dearth of data and adverse weather conditions, offers greater promise for tourism than for trade. The NWP's operation, while growing, is still limited to pleasure ships and government vessels. Neglecting minor time savings, the NWP does not appear to be a viable alternative to the Panama Canal [37].

The subject of offshore oil and gas in more accessible Arctic areas catches the public's attention next. Arctic nations must reconcile the ever-increasing threat of climate change with their massive economic reliance on the fossil fuel sector. As ties with the United States deteriorate, Russia is laying out plans to increase offshore drilling, turning to an eager China for funding. Despite legal constraints, the US has expressed a willingness to follow Russia's lead and expand offshore drilling in the Arctic. With Canada's embargo on Arctic offshore drilling and both countries' expenditures in ecologically friendly technology, both countries appear to be striving to cultivate an image of sustainability [24].

Consequently, a fully sustainable energy market remains more rhetoric than action, as the oil and gas sectors in Canada and Norway continue to expand unabated. Many major media outlets grossly exaggerate the current geopolitical situation in the Arctic. Claims of an "Arctic Scramble" have been made, Many headlines refer to a "new Cold War" and a "race to the North," conjuring pictures of Arctic states frothing at the mouth, neighbors pitted against neighbors in a fierce battle for Arctic hydrocarbon riches [15]. These articles also overstate the NSR's potential as an international trade route, implying a picture of tense ties between Arctic governments for access to and controversies over Arctic waters. Such headlines are catchy, but they aren't true. Such depictions ignore the intricacies and subtleties of the Arctic situation, including the harsh Arctic environment, logistical and financial obstacles to Arctic shipping, and the increasingly implausible logic of offshore growth. Furthermore, these alarming claims fail to recognize the Arctic Council's and Arctic states' shared concept of collaboration. The Arctic Council's structure encourages strong

relationships by requiring agreement, which essentially acts as veto power, and explicitly excluding military issues off its agenda. Thus, combined with the internal division of government agencies, has allowed Arctic states to compartmentalize issues and separate international and regional venues while remaining aligned with the Arctic Council's policy and cooperative history. The growth of the Arctic area is dependent on the management of interdependence, which trumps sovereignty concerns. This won't be right to say that there haven't been disagreements in the Arctic realm; it would be far too kind and naive to claim that there aren't any [31].

Chapter 6

6. Summary

6.1 Conclusion

In a nutshell, in the Arctic, conflict frequently arises from a clash between two concepts: political rivalry and economic cooperation. Russia aims to assert its Arctic dominance, but this will need substantial foreign investment; Canada faces sovereignty threats from the United States, but places a high priority on bilateral commerce with the United States; and China seeks political power through financial contributions. Despite the fact that competition is ubiquitous, cooperation is the dominating story. Arctic states have a track record of peacefully and constructively settling jurisdictional disputes in accordance with Arctic Council principles. A longstanding maritime boundary issue between Norway and Russia, for example, was amicably settled in 2010, delimiting a border in the Barents Sea [38]. During the four decades that the dispute lasted, only nonviolent efforts to resolve the conflict were made, reflecting both Arctic nations' dedication to cooperative and friendly ties. The Russian and Norwegian foreign ministries co-authored an article in the Canadian newspaper The Globe & Mail after the boundary issue was resolved, urging Canada to remember that "if there is one thing that the Arctic's bitter cold and lengthy winters should teach us, it is that no one lives alone out there for long," underlining not just the advantages but also the importance of cooperation in the Arctic region [39].

Finally, see the Arctic as more than just a vast expanse of ice and an untapped wealth of resources; it also holds economic opportunity beneath each snowbank. The fate of the Arctic is a complicated topic that is influenced by the political destiny of Arctic protagonists as well as the global challenge of climate change. Allow the misconceptions that have both exaggerated and undervalued the Arctic to be dispelled-reject those that exaggerate the Arctic's economic potential, and reject those that minimize its climatic and geopolitical complexity [40].

6.2 Practical Implications

It is critical to realize that we must proceed with extreme caution while dealing with Arctic issues. The Arctic acts as a worldwide climate regulator and acts as the Earth's thermostat. Variations in the Arctic climate reverberate southward, distributing the effects of anthropogenic climate change across the world. The implications of sea ice melt have been the focus of this research, but there are a slew of other environmental factors that influence Arctic climate and geopolitics. This study has skipped over considerations of ocean acidification, plastic waste, and any in-depth look at methane and other strong greenhouse gases in the interest of brevity and depth. These are only a handful of the numerous elements to consider while predicting and researching the Arctic's geopolitical future. Moreover, socioeconomic issues were left out of this research, which are critical in the regulation process [4]. What impact will greater international trade through

Arctic seas have on Indigenous peoples and Arctic residents? What are the ramifications for other businesses, like as fishing, which employ a large number of people in Arctic countries? Which towns would bear the brunt of increased Arctic traffic-related emissions, pollution, or spills? Which areas are the most affected by oil and gas drilling? Do they have the legal and institutional tools that they need to advocate for their own health and well-being? Is the inclusion of Indigenous voices in the policy-making process adequate? Aside from these purposeful exclusions, scarce and inconclusive research limits any discussion of the Arctic.

As previously stated, forecasts for an ice-free Arctic summer are contradictory. Long-term climate models, particularly those disseminated by highly regarded sources such as the IPCC, need to be updated and modified. Today's inconsistencies between climate models obstruct scientifically-based policy-making advances, and greater cohesiveness will be required to allow responsible resource management, a greater grasp of geopolitical problems, and increased calls for climate action. We must demand and finance research in order to develop a more precise and widely-accepted scientific method [5].

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