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## **ENVIRONMENT AS A CULTURAL AND ECONOMIC “BARRIER” OF CANADA**

**Abstract:** The aim of this paper is to show to what extent natural conditions and environment are a factor in the distribution of population in Canada and their division into north and south. How it historically affected the different cultural and economic development of Canada, the deep regionalism between the North and the South. How much that modern climate change has an affect on “opening” the region of North Canada (the territories of Nunavut, Yukon and Northwest territories). By analyzing climate tables and maps and comparing them, we conclude about the magnitude of climate changes that have occurred in that region in the last few years and decades and their positive and negative effects on the local population. The results showed that this historical "barrier" of the region is slowly "melting" with the ice. This paper is significant for two reasons, the first is to explain the historical division of the country through natural conditions as the main factors of division (into the southern more populated part and the northern sparsely populated part of Canada) and second to show how climate change really changes the everyday life of the local population in a positive (economic growth and employment) and negative (environmental change due to climate change and environmental pollution due to the arrival of industry in those "remote" areas) aspect.

**Key words:** climate, economy, population, culture, Canada, natural conditions, regionalism, barrier

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## **Introduction**

The aim of this paper is to prove that the climatic barrier that historically existed between the north and the south of Canada is slowly disappearing due to climate change. First, an economic barrier, but also a cultural one. My main contribution is to prove the existence of climate change with concrete data in temperature changes (because there are many denials of its existence), to show both the positive and negative sides of the economic "potential" of northern Canada and how the cultural "barrier" is disappearing (due to the increasing settlement of the non-native population to the north) has its positive and negative sides. The importance of this topic is to point out the problems that climate change brings not only to this region but also to the whole world, but also to show the adaptability of people to change, especially if there are economic "gains".

Based on the naturalistic foundations of the researched area (geography, biology, climatology, etc.), this paper establishes the scientific thesis of climate change and its direct connection with the abolition of the economic and cultural "barrier" of the northern part of Canada. In the last decade and a half (15 years), the Government of Canada has declared this area as the future strategic development of the country, first economically, because they also recognized that due to climate change (increasingly hotter temperatures), the tundra area, which was economically unprofitable before, is now possible for exploitation (Germain, 2017). This is reflected in the increasing opening of mines in the region in the last few years and the growth of the region's population, admittedly still on a small scale, but considering the previous few censuses where there was very slight growth in this region, the higher growth certainly contributed to the increasing number of non-native population in search of good paid jobs to settle in this region and gradually change the demography of the region. The local Inuit population, but also the tribes of the First Nations, do not have a positive attitude towards this change because a culture that is not theirs is imposed on them, as well as the negative effects of industry and mining on what is still "their" environment.

One of the goals of this paper is to present potential solutions to this problem in which this area of the northern region of Canada has found itself. But certainly, whatever solution is suggested, it is up to the decision of the Canadian government and the local population that lives there. This is a delicate process because it is in the economic interest of the state and people to develop the region, but at the same time it is important to preserve the natural and living environment that exists there. As well as the cultural heritage and traditional life of the indigenous population, which he clearly expressed that he is willing to fight for.

## **Methodology**

In this paper are used methods of comparison, analysis, synthesis, induction and deduction and the method of statistical analysis, tabular and other methods of text illustration, historical method, method of generalization and specialization, etc. The following statistical databases were used: Canada's national statistical agency - Statistics Canada, Report of the Canadian government on the economic potential of the North of the country in December 2010 (Report of the conference board of Canada-Mapping the Economic Potential of Canada's North), official results of the 2021 Canadian census (Statistics Canada), climate maps and tables on average temperatures from the Climate Atlas of Canada.

The methodological process was most influenced by the works of other scientists and academics mentioned in the references who through their works showed the connections of natural conditions (environment) with the historical, demographic, cultural and economic barrier of Canada, my contribution is to show the disappearance of that historical barrier, the global change of natural conditions and the influence of other unchanged impact on that barrier. Climate change is the most important factor in the gradual removal of the barrier, but other factors such as latitude, longitude, distance from the sea and geomorphology and relief of the terrain remain (example of the Canadian Shield) and which still have a significant influence on the population distribution of the region.

## Results

An important dimension for understanding the extraordinary economic transformation of the Canadian North region is the presentation of the change in climatic conditions in that area over time, thereby confirming the thesis that climate change is really happening and that it is directly responsible for economic and therefore cultural changes in the region.

*Table 1. Average maximum daily temperatures in January and July for the largest settlements in the Canadian North region for the years 1991 and 2021*

Settlement	Temperatures in January (left for 1991, right for 2021)		Temperatures in July (left for 1991, right for 2021)	
Yellowknife (NWT)	-22°C	-13°C	21°C	26°C
Inuvik (NWT)	-23°C	-14°C	20°C	24°C
Alert (Nunavut)	-29°C	-21°C	6°C	13°C
Iqaluit (Nunavut)	-9°C	-5°C	12°C	19°C
Baker Lake (Nunavut)	-18°C	-11°C	17°C	21°C
Whitehorse (Yukon)	-11°C	-7°C	19°C	23°C
Dawson (Yukon)	-22°C	-16°C	23°C	28°C

Source: Statistical database Climate Atlas of Canada

Using the historical method as well as the methods of analysis, synthesis, deduction and tabular method, we concluded that climate change is really happening in this area and confirms the theory of global warming. Now we come to the thesis of whether these climate changes bring about the economic transformation of the region and the unlocking of the economic "potential" of this area.

This area has historically been economically unprofitable for the exploitation of fossil fuels and minerals mainly due to the harsh climate in the tundra area and the lack of appropriate infrastructure (roads, railways, shipping and air traffic). The local population traded with the rest of the country primarily by ship traffic during the summer (when the Hudson Bay is thawed) and by air traffic in the winter. That is changing in the last few years, the government of Canada has invested since the mentioned report from 2010 in several highways and highways to the north of the country (Mackenzie highway, Aklavik highway, etc.). The so-called "ice" roads that are characteristic of this area and are used in winter when a large number of lakes in the region freeze. Due to climate change, shipping lanes are open for longer each year (in 1991 the average was 4 months, today the average is eight months) (Lasserre & Têtu, 2020). As infrastructure develops and the climate changes, this region has seen more new mines open in the last ten years than in the last half century. These are primarily gold, diamond, cobalt and

nickel mines. Territory diamonds are heavily touted as a substitute for "blood diamonds". The world's two largest mineral resource companies, BHP and Rio Tinto, mine most of their diamonds here for the global market (Kjarsgaard & Levinson, 2002). The gross domestic product (GDP) of the Northwest Territories (NWT) was 4.85 billion Canadian dollars last year, which is the highest GDP per person of all Canadian provinces and territories (76,000 Canadian dollars per person). The largest part of it came from the production of mineral resources and fossil fuels, over 80%, but the increase in tourism in the last ten years is also not negligible (Statistics Canada).

Nunavut's industry is based on natural resources and traditional industries and activities such as hunting and fishing. Mining is based on large reserves of iron and precious ores such as gold and diamonds. Of the mines, the largest are the Meadowbank Gold Mine, which employs over 700 workers, and the Mary River Iron Mine, whose products are of high quality and valued. The iron mine is owned by Baffinland, a local private company that employs over 2,500 workers and the company itself accounts for 23% of the GDP of the entire territory. The mine and company are located in Pond Inlet on Baffin Island and opened in 2011 (Statistics Canada). It is unnecessary to talk about the Yukon, the territory is historical and was created during the "gold rush", so mining has always been a priority there. In the last few years, the start of exploitation of large oil and gas reserves found in the Canadian part of the Arctic 30 years ago has been seriously considered. Due to climate change, the exploitation of these reserves has never sounded more realistic for the Canadian government.

According to the regional GDP growth data from the statistical database of the Canadian Statistics Organization using the methods of comparison, analysis, synthesis, induction and deduction, as well as the method of statistical analysis, the historical method, the method of generalization and specialization we came to the conclusion that the economic transformation of the region is already in full swing and with the opening of mines and the very soon exploitation of fossil fuels leads to new employment in the region, mostly for the non-native population. This leads to population growth because new workers come with families, who then need education, health and basic services, which has a "boomerang" effect on new employment and population growth and changing the demographic picture of the region (Pomfret, 2013).

Here we come to the thesis about the disappearance of the cultural barrier between the north and the south of Canada, which can be proven by examining the number of inhabitants of the region historically and their ethnic structure over time.

*Table 2. Total population of Canadian territories (Canadian North region) and ethnic structure of the population according to the 1991. and 2021. censuses*

Total population of the Canadian North region in 1991	Ethnic structure of the population in 1991. (indigenous population on the left, non-indigenous population on the right)		Total population of the Canadian North region in 2021	Ethnic structure of the population in 2021. (indigenous population on the left, non-indigenous population on the right)	
87,957	63%	37%	118,160	45.8%	54.2%

Source: Canada's national statistical agency

Using the historical method as well as the methods of analysis, synthesis, deduction and tabular method, we concluded that the number of inhabitants of the region is increasing, but that the demographic picture of the region is different in terms of ethnic structure. Today, the majority of the population in Canada's north is of non-Aboriginal descent, which was unimaginable just a few decades ago. With the greater arrival of "European" Canadians in that territory, the cultural barrier that existed primarily due to climatic conditions is slowly disappearing. The indigenous population is under increasing pressure to assimilate to a foreign culture, which they resent very loudly, but for now there is no hearing for them at the top of the federal government (Boyd, 2015).

The government justifies cultural assimilation with economic progress, but the local indigenous population does not see this "progress" because they are not the ones who are employed in the newly opened mines due to the lack of education and the desire for such work. The traditional life of the Inuit and First Nations (indigenous population) has been largely destroyed by such infrastructural and economic projects in their local environment. The traditional life of the natives is first of all reflected in hunting, fishing and whaling and preservation of their cultural identity and religion of spiritualism. But with the arrival of heavy industry and mining, there are negative consequences for the local environment that pollute the local watercourses used in the mining process, as well as changing the landscape and destroying the few local flora and fauna. There is extensive evidence of the negative consequences of mining for the environment of the region, which will be discussed in more detail in the next chapter, but unfortunately little is being done to rehabilitate and remove the negative consequences for the living world in the region (Prowse et al., 2009).

As for potential solutions to this problem, there are several of them. The government of Canada can put the entire territory into a protected nature park and ban the exploitation of mineral raw materials and fossil fuels, but due to the excessive economic "benefits" this is very unlikely. Great efforts can be made to introduce laws on environmental protection with the view that mining is done exclusively with "green" technology without contaminating the surrounding area, but whether there is political and economic will for that is a question. Such technology exists and is more expensive, but certainly better for ecological processes in the region and preservation of biodiversity.

## **Discussion**

Canada is the second largest country in the world after Russia. Historically, a large part of its territory was sparsely populated. The arrival of European colonizers contributed to a great tragedy among the natives due to the transmission of diseases to which they were not immune, primarily influenza and measles. This primarily refers to members of the First Nations (tribes from the plains), while the Inuit were relatively protected due to the natural conditions as a barrier, because they mostly inhabited the north of Canada (tundra), where Europeans did not go or were interested in it (Srećko, 1977). Due to the "milder" climate in the south of the country, along the border with the USA, the largest number of residents and new migrants settled and continue to settle (Chiotti, 1998).

Several types of climate can be found in Canada, the extent of which depends on the geographical location and the climatological factors acting on the given area. According to Köppen's climate classification, most of Canada has a humid boreal climate (Df). The

extreme south of Canada, along the border with the USA, has a subtype of humid boreal climate with warm summers (Dfb), while further north there is an area of humid boreal climate with cool summers (Dfc).

Winters are harsh, with average daily temperatures of -15 °C, and can drop below -40 °C. In areas farther from the coast, snow can remain for up to 6 months a year. Average maximum temperatures range from 20 to 25 °C, while on the coasts the average maximum summer temperature varies from 25 to 30 °C, with occasional extreme heat in some inland areas exceeding 40 °C (Ducić & Anđelković, 2004). The West Coast, in the province of British Columbia, is an exception to the country's generally harsh climate. A moderately humid (oceanic) type of climate (Cf) prevails there, i.e. its subtype humid subtropical climate (Cfa), and in places (south of Vancouver Island) the Mediterranean type (Cs) occurs, with a subtype of Mediterranean climate with hot summers (Csb). Winters in this area are mild and rainy. The far north of the country has a polar type of climate (ET) with tundra as the predominant vegetation (Golić, 2021).

Canada has more lakes than any other country and contains much of the world's fresh water. It also has a large hydropower potential that is used but a large part is "trapped" especially in the northern parts of the country due to the freezing of rivers and lakes during the winter months. Looking at the data, one can easily come to the conclusion that the climate is the main factor in the development of the country, in the south where it is pleasant it is developed, in the north where it is extreme it is in every sense of the word (economic, climatic, infrastructural, demographic, cultural) a real "polar desert" " or at least she was.

Climate is the most important factor that serves as a barrier to the development of Canada's economy and society, the limiting factor of the spatial structure of the population that lives mainly in the south near the American border, the disparity between regions in every sense (from economic to cultural)- the further it weakens federalism and has its own geopolitical consequences, although scientists believe that in the last few years that trend is slowly changing due to climate changes that are most felt in the tundra belt.

However, climate is not the only natural factor that has historically dictated Canada's north-south demographic "barrier". Topography, latitude and longitude, soil fertility are all influencing factors. One of the major factors is the geomorphology of the terrain of the east and north of Canada marked by the Canadian Shield. The Canadian Shield is the second most important factor in the settlement of Canada after climate and serves as a demographic and infrastructural barrier (Shilts et al., 1987). Today, the scientific community is united in the fact that we are in the process of climate change, the so-called. "global warming". These changes are happening everywhere, but they are mostly pronounced in border climate regions. An example of such a region is the Canadian North, where there is a border between boreal and polar climates, or the so-called "Sahel region", where there is a border between desert and semi-desert climates. In both cases, some types of climate "wins" in these climate changes. In the Sahel area, it is clear that the winner is the desert climate because the Sahara desert is expanding south every year, and as for the Canadian North region, it is clear that the polar climate is the "loser" in these changes because the belt of "eternal ice" is increasing every year. pulls to the north. Scientists predict that by the year 2100, the boreal forest and climate belt will move northward in the areas of today's tundra, and the tundra belt will remain only on some islands in the Canadian Arctic Archipelago, and thus the changes will also alternate in the south, for example in Alberta

it will no longer be a continental climate with a prairie subtype rather it will be more like the subtropical climate of North Africa, etc. (Assessment, A.C.I. 2004).

This region is extremely promising precisely because of climate change and the increasingly accessible mineral resources of the region for extraction. This is the reality of this region in the near future and there will be an increasing industrialization of the region, but the problems are not economic, but the local economy, which has been established for centuries by the local population, who lead an extremely traditional life, which will be damaged more and more. And all this leads to increasing ecological problems in the region. As if all the problems of climate change were not enough, now there are also environmental problems of pollution that the industry brings with it.

Environmental problems also arise with the expansion of diamond mines in the north of Canada, among the many problems are, for example, the worsening air quality around the mines, the disruption of the local ecosystem with the spatial expansion of the mines themselves, the increasing percentage of mercury and ammonia in the waters around the mines used in production, the increasing share of carbon dioxide that is released by production into the atmosphere directly damages the ozone layer or when the mine is closed, usually a huge "hole" is just left in nature with all the chemicals that destroy the living world in the environment (Pearce et al., 2011).

We should not forget the collapse of the culture and traditional life of the natives. There are studies by psychologists that link climate change and the increasing rate of depression and suicide among natives in the Canadian North (Lebel et al., 2022). There are also positive things about the collapse of the cultural barrier, which is better health care for the natives with the arrival of modern hospitals in the north and an increasing number of educated and highly educated natives, but whether all this is enough for their silence in the process of assimilation and the devastation of the local environment is up to them, to say (Vogel & Bullock, 2021).

Canada has many challenges related to the climate and other natural conditions that try to slow down its development, but today large economic investments are sent especially to the northern region where, increasingly due to climate change, resources are more accessible and economically profitable (this primarily refers to the discovery large deposits of oil and gas in the part of the Arctic that belongs to Canada). The question for the population of the region is whether the potential of "economic and civilizational prosperity" is worth all the changes that are happening to them and that will inevitably follow (Bevanda, 2018).

## **Conclusion**

This paper aims to raise awareness about climate change, which is happening all over the world, but is most pronounced in certain regions like the Canadian North. However, it is not only climatic changes, but also demographic, cultural, economic, etc. We should not forget the geopolitical changes, because due to climate change it is already predicted that water will be the biggest strategic resource in the 21st century, in the case of the Canadian North, climate change has led to the "opening" of the Arctic Ocean, as a potential new water "highway" for transporting goods in the world due to its geographical position, which entails new geopolitical potential confrontations in the Arctic between Canada, the USA, and Russia (Greaves, 2021; Radaković, 2014).

This research is significant for the sake of understanding that the population of any region of the world is primarily governed by natural conditions that dictate where and how the population settles, that the Canadian region is not the only one in the world where natural conditions determine economic, cultural and demographic barriers, but also that in today's period of changing global natural conditions, man as an individual and people as a group has proven to be extremely adaptive to emerge as a winner in global changes in natural conditions, be it in the biological drive for the extension of the species (population growth), economic (by opening new natural resources) or geopolitical (that "my clan or tribe"- the nation survives the emerging changes).

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