

Economics Extended Essay

THE IMPACT OF CRUISE SHIPS ON GREENLAND'S ECONOMIC GROWTH AND DEVELOPMENT

RESEARCH QUESTION: TO WHAT EXTENT HAS THE ROLE PLAYED BY CRUISE SHIPS IN
ADVANCING THE ECONOMIC GROWTH OF GREENLAND CORRESPONDED TO ITS ECONOMIC
DEVELOPMENT?

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Introduction:

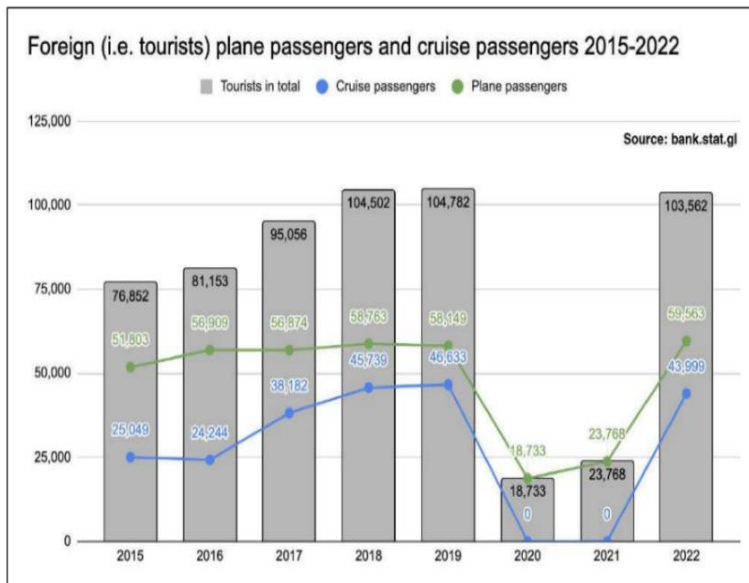
While cruises began sailing to Greenland in the 1980s, the 2016 voyage of the *Crystal Serenity*, the first luxury cruise line to cross the Northwest Passage and reach Greenland², was revolutionary. Since then, over 40,000 cruise passengers (Image 2) annually call this a vacation spot, capturing the nation's picturesque beauty before global warming. The ships benefit local communities by generating revenue and shaping Greenland's third economic pillar: tourism.

Image 1: Map of Greenland

1



Image 2: Foreign Plane and Cruise Passenger Comparison (from 2015-2022)



3

Yet, with a population of 57,000, less than average cities, debates concerning cruise impacts on the nation's development rise, prompting the question: **To what extent has the role played by cruise ships in advancing the economic growth of Greenland corresponded to its economic development?**

¹ 1. WorldAtlas, "Greenland Maps & Facts," WorldAtlas, February 25, 2021, <https://www.worldatlas.com/maps/greenland>.

² Brady Dennis and Chris Mooney, "A Luxury Cruise Ship Sets Sail for the Arctic, Thanks to Climate Change," The Washington Post, October 27, 2021, <https://www.washingtonpost.com/news/energy-environment/wp/2016/08/16/a-luxury-cruise-ship-sets-sail-for-the-arctic-thanks-to-climate-change/>.

³ 1. Mads Lumholt, "Tourism Statistics Report Greenland 2022," Visit Greenland, May 2023, https://tourismstat.gl/wp-content/uploads/2023/07/Tourism-Statistics-Report-Greenland-2022.pptx_compressed.pdf.

Greenland, an autonomous country within the Kingdom of Denmark, has attempted to become independent under the “Greenland’s Self Government Act”⁴ since 1979 and believes tourism can contribute towards building a robust economy. German-British economist E.F. Schumacher states, “Economic development is much wider and deeper than economics, let alone econometrics. Its roots lie outside the economic sphere, in education, organization and discipline and beyond that, in political independence and a national consciousness of self-reliance,⁵” proving that sufficiency is difficult without success from its citizens.

This is evident from Iceland, an island like Greenland, that encountered sudden economic growth and an influx of tourists amidst the 2008 banking crisis⁶. With few plans of building a stable infrastructure equipped with adequate facilities, over-tourism: a **negative externality of production** resulting from overcrowding, became a major problem.

As Greenland rapidly welcomes modernization, it becomes valuable to investigate whether a secluded nation can successfully achieve an **economically sustainable** industry: one focusing on long-term development and useful allocation of resources while maintaining stable growth in the short term.

Methodology:

Initially, economic growth was researched to identify whether cruise ships genuinely boost income and spending and provide metrics regarding how development should progress.

⁴ Tanny Por, “Greenland’s Modern Path to Independence,” Visit Greenland, April 18, 2023, <https://visitgreenland.com/articles/greenlands-modern-path-to-independence/>.

⁵ E. F. Schumacher. AZQuotes.com, Wind and Fly LTD, 2023. <https://www.azquotes.com/quote/501895>.

⁶ 1. Carina Ren, “What Can Greenland Learn from Iceland’s Experience with Tourism?,” Aalborg University’s Research Portal, 2019, <https://vbn.aau.dk/en/projects/what-can-greenland-learn-from-icelands-experience-with-tourism>.

Later, theories relating to macroeconomics, primarily surrounding the **Human Development Index (HDI)** were calculated to see the correlation. The HDI is a well-rounded index implemented by the United Nations (UN) ranging from 0 (low development) to 1 (high development) that concludes a country's development progress using health, education and living standard indicators. The equation used is:

Equation 1: New HDI Calculation Equation⁷

$$\text{New HDI} = (\text{Health} \times \text{Education} \times \text{Living Standards})^{1/3}$$

Where:

Health = Life Expectancy Index

Education = 1. mean years of schooling index

2. expected years of schooling index

Living Standards = Gross National Income per Capita

Due to Greenland's small population, HDI is not recorded independently by UN, and data on GNI is unavailable. Therefore, HDI was manually calculated; since the older version of HDI, used until 2010, incorporated Real Gross Domestic Product (RGDP) per capita, it was analyzed instead. Although GDP per capita disregards how much money remains within country borders⁸, Greenland's similar emigration and immigration rates mean that money leaving the economy should equal the money entering, making it justifiable to assess this indicator. These indicators were transformed into indexes from the Dimensions Index:

⁷ 1. Alok, "Chapter 2: The Advance of People - University of Victoria," Original HDI, August 19, 2014, <https://web.uvic.ca/~kumara/econ329/HDRCH2.pdf>.

⁸ 1. Diego Reyles, "The Human Development Index (HDI)," Oxford Poverty and Human Development Initiative, 2010, <https://ophi.org.uk/wp-content/uploads/HDI-measure-interpretation-key-messages.pdf>.

Equation 2: Calculating Dimensions Index

$$\text{Dimension Index} = \frac{\text{Actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}}$$

The dimensions index for living standards is calculated using natural logarithms of the values as it conveys how money depreciates as GNI (or even GDP) per capita increases⁹. These manipulations are insignificant as the HDI score is not compared to other countries and the consistent methodology enables for worthy development interpretations over the years.

To assess these trends, Greenland was evaluated as a whole nation. Nonetheless, it is paramount to note that certain destinations including Nuuk, Ilulissat and Kangerlussuaq are more receptive to cruises than others, and this can lead to discretion in overall development.

To ensure the validity of the sources and eliminate partisanship, data is retrieved from Statistics-Greenland, Visit Greenland and Sermitsiaq AG: the Greenlandic newspaper. These sources were found by emailing locals I met during my trip to Greenland in the summer of 2023. Many articles were written in Danish and were translated into English by Google Docs, causing slight variations in interpretation, but does not disrupt the message of the article.

Since many secondary references faced data lag or were outdated, meaningful interviews were conducted with Rie Oldenburg: the Head of Education at Campus Kujalleq, and Elizabeth Cooper: a PhD fellow at Copenhagen Business School applying behavioural science to promote sustainable cruise tourist behaviour in Greenland. These were contacted as they have proficient knowledge in their fields of inquiry; queries asked were factual rather than opinion-based to prevent bias, (transcripts available in *Appendix A and B*). Email interviews were held with Stine

⁹ Ibid, 5

Selmer Andersen, the former Head of Sustainability with Visit Greenland; Daniel Minik Ostergaard Madsen, academic clerk in Economic Statistics and modelling; and Lars Pedersen, the chief statistics advisor at Statistik-Greenland.

Although information was primarily collected from years 2018, 2019, 2022, and 2023, it is compared to years from 2015-2017, allowing for a genuine evaluation. Due to the COVID-19 halt in cruises, 2020 is not used in the assessment. Although cruises started in 2022, data was unavailable, so it was reasonable to include 2021).

Theoretical Hypothesis:

Economic growth is the increase in real national income analyzed with RGDP and RGNI. RGDP conveys the total output produced within a country, while RGNI sees the total income earned by a country's factors of production, regardless of its location, and oversees RGDP.

A 2015 survey tracked the average cruise passenger spending¹⁰. To make these numbers recent, I recorded the **Consumer Price Index** (CPI) values from 2015 to 2023 (*Table 1*) and used *Equation 3* to alter the prices of products over the years (*Table 2*). CPI values, compared to a base year, measure the price changes consumers must pay for a basket of goods over time. Spending for crew passengers is found in *Appendix C*. These values were converted from Euros (EUR) into Danish Kroner (DKK) from December 31st, 2023, exchange rates, where 1EUR=7.4564DKK¹¹.

¹⁰ 1. Visit Greenland, "Greenland Cruise Survey 2015, GP Wild," Google Slides, 2015, https://docs.google.com/presentation/d/1mPT0EFNOVltt42FutNtenCPURYvKZ9dsY0u7k_DztDo/edit#slide=id.p14.

¹¹ 1. "EUR/DKK Currency Exchange Rate & News," Google Finance, December 31, 2023, <https://www.google.com/finance/quote/EUR-DKK?sa=X&sqi=2&ved=2ahUKewjYmLL9nMeDAXUzkYkEHY41DeAQmY0JegQICRAr>.

Equation 3: Using CPI Values to Determine the Changes in Price from 2015 to 2023¹²

$$Value_{2023} = Value_{2015} \times \frac{CPI_{2023}}{CPI_{2015}}$$

Table 1: CPI Values from 2015-2023 (where 2008=100)¹³

Year (from January)	CPI where January 2008=100
2015	117.0
2018	119.4
2019	120.1
2020	123.0
2021	123.3
2022	123.6
2023	127.0

Table 2: Average Spending Per Cruise Passenger Throughout the Years (DKK)¹⁴

	2015	2018	2019	2020	2021	2022	2023
Shore Excursions	368.12	375.65	377.89	386.99	387.96	388.85	399.59
Food + Beverages	104.46	106.55	107.22	109.83	110.06	110.35	113.34
Taxis/Transportation	136.45	139.29	140.03	143.46	143.83	144.13	148.08
Watches + Jewelry	169.48	172.99	173.96	178.21	178.58	179.03	183.95
Clothing	154.27	157.63	158.37	162.18	162.55	163.00	167.47
Local Crafts + Souvenirs	160.31	163.59	164.56	168.51	168.96	169.33	173.96
Entertainment/ Nightclubs/ Casinos	112.37	114.68	115.35	118.11	118.41	118.71	121.99
Museums + Galleries	35.27	36.01	36.24	37.06	37.13	37.28	38.25
Other	341.13	348.14	350.15	358.65	359.47	360.37	370.28

¹² 1. Greenland Statistik, "Greenland in Figures - Stat," Greenland in Figures , May 2023, <https://stat.gl/publ/en/GF/2023/pdf/Greenland%20in%20Figures%202023.pdf>.

¹³ Ibid, 7

¹⁴ Ibid, 7

This sums the average spending for passengers to be 1717.75 DKK, and the total spending for crew members to be 701.05 DKK.

Before 2016, expedition cruises, which contain fewer passengers, were the most prominent. In 2023, with nearly 44,000 passengers, this amounts to a minimum revenue of almost 75.5 million DKK, indicating upward advancement and increasing **exchange rates** as more passengers sell their currency for DKK.

Since 2019, cruises also paid port fees of 1.10 DKK per gross tonnage (GT) per 24-hour period.¹⁵ According to the Danish Tax Agency, cruise lines paid 9 455 562 DKK in call fees in 2022, an exponential surge from 7 866 748 DKK in 2019, even though there were slightly fewer passengers in 2022 than in 2019¹⁶, proving a large flow of income into the industry. This excludes additional payments to harbour agents for handling water, waste, fuel, oil, and provisions. This income would amount to a minimum of 85 million DKK; Greenland's GDP is 20.36 billion DKK¹⁷ meaning that it could contribute to roughly **0.5 (0.42%)** to the economy, whereas in 2015, fewer passengers and less spending would have contributed for roughly 0.3% (assuming gross tonnage paid was around 7 million then, like in 2019).

As tourists travel there, they convert their local currencies to DKK, causing greater **exchange rates** and currency appreciation. This entails a greater contribution to the **aggregate demand** (AD) and RGDP of the nation as prices increase, signalling inflation. Since tourism is

¹⁵Naalakkersuisut: Government of Greenland, *Havneafgift i Grnland endelig dk1docxdaDK enUS eng marts*, Government of Greenland. 2019.
file:///C:/Users/ashah/Downloads/Havneafgift%20i%20Grnland%20endelig%20dk1docxdaDKenUS%20eng%20marts%20(1).pdf

¹⁶ ibid

¹⁷ 1. Einar H. Dyvik, "Greenland: GDP," Statista, November 27, 2023, <https://www.statista.com/statistics/805932/gdp-of-greenland/>.

considered an export, net exports (X-M) from the expenditure equation increase (*Equation 4*), inducing growth in RGDP, and AD.

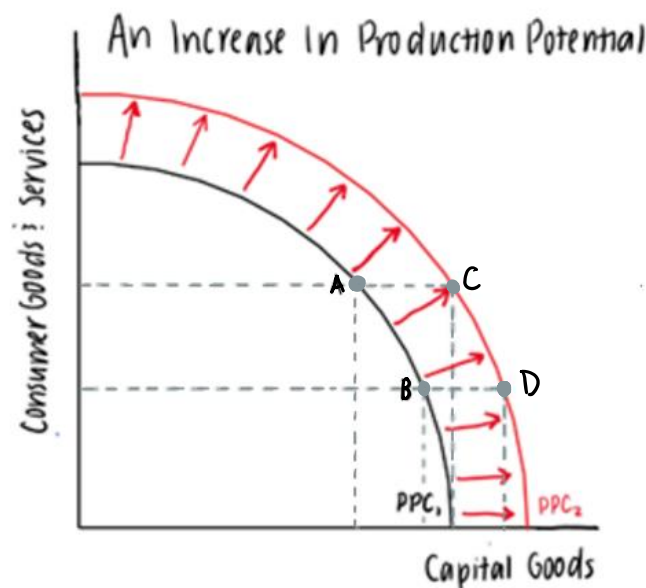
Equation 4: Expenditure Method

$$AD/RGDP = C + I + G + (X - M)$$

Meanwhile, **economic development** focuses on the quality of life and is often subjective and qualitative.

Theoretically, economic growth intensifies economic and human development. **Ceterus paribus**, tourism lowers income inequality through enriched employment opportunities and infrastructure development. Moreover, tourism has twice as many women employers as other sectors.¹⁸ allowing greater efficiency. This boosts development, triggering a higher GDP per capita (average income per person), allowing production potential to climb from A/B to points C/ D.

Figure 1: Production Possibilities Curve for Greenland with Tourism



¹⁸ Cecile Fruman and Louise Twining-Ward, "Empowering Women through Tourism," World Bank Blogs, October 23, 2017, <https://blogs.worldbank.org/psd/empowering-women-through-tourism-0>.

However, development relies upon how governments choose to distribute their money, policy impacts, and sustainability. Cruises are notorious for pollution and waste dumped in the harbour, which is a **negative externality of production**: a cost occurring from the overproduction of cruise tourism than ideal levels. The small land spaces lead to over-tourism in cities, which can create overburdened healthcare systems during emergencies and cause extra money to be spent on catalyzing environmental destruction, which expands RGDP but lowers development.

Consequently, **while cruises can have both positive impacts on the quantitative development and growth of the nation, factors like pollution (lower life expectations), profit-maximizing companies only partially dedicating to the advancement of the nation, and insufficient government allocation of funds, may prevent Greenland from thriving.**

Analysis:

1. HDI:

Table 3 below depicts the indicators that create the index, and their corresponding minimum and maximum values, set by the United Nations.

Indexes like the Mean Years of Schooling and Expected Years of Schooling were calculated manually. The Mean Year of Schooling was found by determining how many people (ages 16-74) obtained a certain type of education, ranging from lower secondary education (10 years) to Ph.D. (estimated 25 years), and formulating a weighted average on the number of years it took to complete their education. The data and sample calculation are disclosed in *Appendix D*. Slight discrepancies may occur in the number of years it takes to obtain a high-level education since it depends on the program being studied. For consistency, the years 2015 and 2022 are chosen

(data for 2023 not yet available). The Expected Mean is set at ten because it is the mandatory year of education in Greenland, meaning that everyone is expected to at least complete it.

Since UN does not set a minimum and maximum value for **GDP per capita, Purchasing Power Parity (PPP)**, they were acquired by retrieving the highest and lowest GDP per capita, PPP countries, since they highlight ranges of data. This impacts HDI as every country's growth rate is different and is not necessarily related to cruises. The calculations are seen below:

Table 3: Greenland's HDI Data Values Life Expectancy in 2015 and 2022, compared to minimum and maximum values (by UN).

Indicator	Year	Minimum Value ¹⁹	Greenland's Value ²⁰	Maximum Value
Life Expectancy	2015	20.0	70.7	85.0
	2022	20.0	71.0	85.0
Mean Years of Schooling	2015	0	13.4	15.0
	2022	0	13.8	15.0
Expected Years of Schooling	2015	0	10.0	18.0
	2022	0	10.0	18.0
GDP per Capita, PPP	2015	629 (Central African Republic)	41 800 ²¹	130 319 (Qatar)
	2022	708 (Burundi) ²²	57 116 ²³	115 542 (Luxembourg)

¹⁹ 1. Technical notes - human development reports, 2022, https://hdr.undp.org/sites/default/files/2021-22_HDR/hdr2021-22_technical_notes.pdf.

²⁰ Ibid, 8

²¹ 1. "GDP per Capita (Current US\$)," World Bank Open Data, 2021 <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>.

²² 1. "GDP per Capita, PPP by Country, around the World," TheGlobalEconomy.com, 2022, https://www.theglobaleconomy.com/rankings/gdp_per_capita_ppp/#:~:text=GDP%20per%20capita%2C%20PPP%20%2D%20Country%20rankings&text=The%20highest%20value%20was%20in,in%20Burundi%3A%20708%20U.S.%20dollars.

²³ 1. "Greenland- The World Factbook," Central Intelligence Agency, January 9, 2024, <https://www.cia.gov/the-world-factbook/countries/greenland/#economy>.

Table 4: Calculated Indexes of Greenland in 2015 and 2022 using Table 1 and Equation 2²⁴

Index	2015	2022
Health	0.780	0.786
Mean Years of Schooling Index	0.893	0.920
Expected Years of Schooling Index	0.555	0.555
Combined Education Index ²⁵	0.724	0.738
Living Standards	0.787	0.862

The two education indexes are compiled using the arithmetic mean (as used by the UN), illustrated in this calculation:

$$\text{combined education index} = \frac{0.933 + 0.555}{2}$$

The overall HDI, using *Equation 1*, are 0.763 and 0.794 in 2015 and 2022 respectively, representing clear development, aligning with cruise growth data. Nonetheless, limitations exist with the index. For instance, the expected mean year of schooling brings the overall index down, even though it is a theoretical threshold value and may be inaccurate. Moreover, life expectancy, which is the expected number of years a newborn is expected to live in normal conditions, is unlikely to deteriorate quickly unless with the onset of widespread disease. Similarly, the education system cannot change as it relates to government policies, so cruises cannot play a direct role in affecting sections discussed in HDI. However, it can raise the average income of citizens as jobs are generated from spending (page 9). Furthermore, the extra money can help students pursue higher education, programs and get better jobs in the future, which is why the

²⁴ Ibid, 7

mean years of schooling has also increased. Ultimately, it is unreasonable to find the development of a nation using certain indicators that do not change easily. Instead, mental health, and environment are better indicators as they can show the happiness and innovations brought from cruises.

2. Health

In a published webinar by Stine²⁶, it was noted that there is a severe concern over Greenland's overburdening healthcare system that sometimes arises during peak cruising seasons when there are inadequate emergency providers in many small towns.

Evaluating mental health is necessary due to Greenland's high suicide rates, which partially rise from factors "including lack of economic opportunities, climate change, loss of culture, lack of recognition, historical trauma, poverty, inadequate housing and addictions."²⁷

With rising tourism and income opportunities, economic opportunities have augmented, provoking **seasonal employment**. From Rie Oldenburg, many students work in the tourism industry during the summer months and study, complete university, [or] become skippers during the rest of the year²⁸. This creates efficiency in the system, as **Short Run Aggregate Supply** increases from greater feelings of wealth and greater injection of money into the economy, obeying the production possibilities curve (*Figure 1*). The employment also encourages cultural sensitivity, as small settlements build attractions to educate and allure tourists. The webinar

²⁶ 1. Visit Greenland, "Cruise Webinar 2023," Vimeo, December 30, 2023, <https://vimeo.com/832590172>.

²⁷ 1. C.milheres, "Mental Health and Suicide in Canada and Greenland," The Polar Connection, December 5, 2023, <https://polarconnection.org/mental-health-suicide-canada-greenland/#:~:text=According%20to%20the%20Inuit%20Circumpolar,trauma%2C%20poverty%2C%20inadequate%20housing%20and.>

²⁸ 1. IB Student, Greenland Education Development, personal, September 15, 2023.

stated that from nearly 50 interviews with stakeholders directly in contact with cruise industries, they believed, “they have a high quality of life from being able to share their identity and their culture and country [that may otherwise be vulnerable], making them happier to work {in the industry}” and “78.4% people have a positive attitude towards cruise tourism²⁹” resulting in an increased Happiness Index, thus boosting health in the short run.

Unlike airplane travellers, cruises benefit Greenland by bringing their accommodations, so large booms of tourists only occur during certain periods of the day, and space can be used for residential housing. However, this lowers growth, as passengers only have a certain number of things to spend their money on; there will be a shortage of hotels for people coming to Greenland by cruise and flying back by air, representing the trade-off between development and growth: you either sacrifice output for more residential buildings or improve development by limiting the number of tourists.

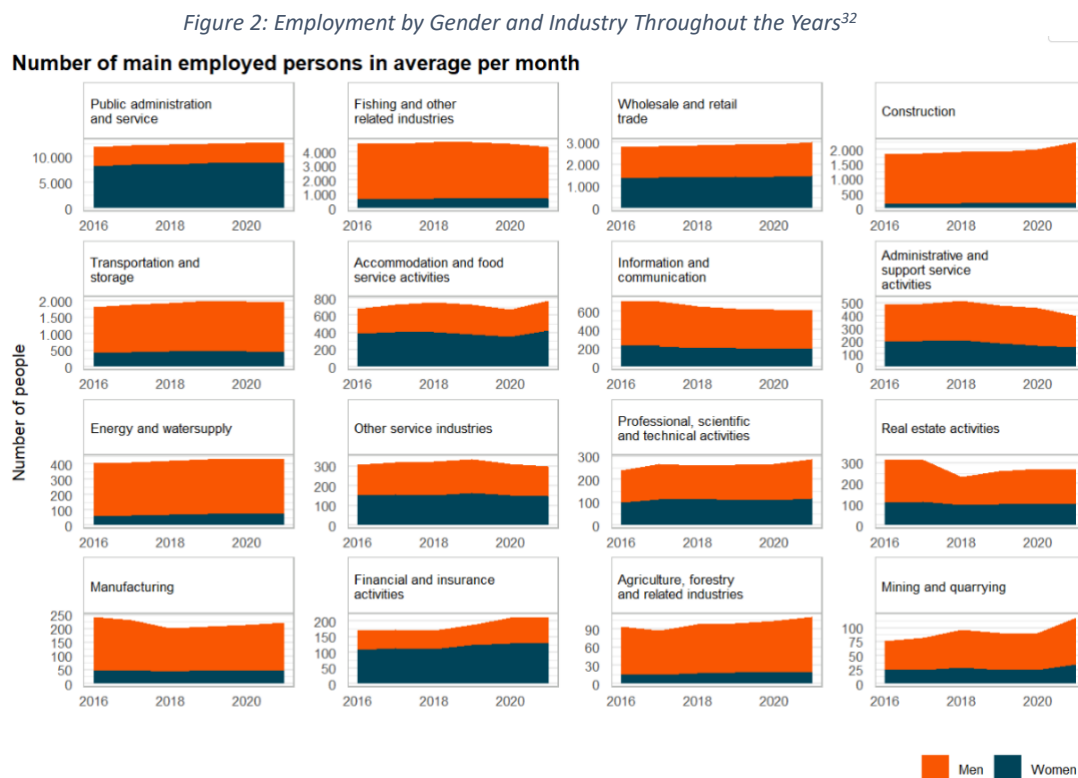
Meanwhile, cruises harm the environment. As more ice melts, more cruises can sail to Greenland, bettering output, although once again at the cost of the Earth. Upon entering Greenland, the government started to implement environmental taxes, but ironically, they do not have any regulations that protect cultural and UNESCO world heritage sites, which have damaged parts of the environment, highlighting that money and taxes are immature in tackling root environmental problems³⁰.

²⁹ Ibid, 14

³⁰ Ibid, 14

3. Education

Additionally, does extra money attract more individuals to enter innovative fields, and grasp more knowledge? From the HDI and the data collected, educational attainment has risen, and women receive more education than men³¹. This can be correlated to the theory that women are far more dominant in tourism than men. This further correlated to education as it is preliminary to be educated when going into these fields. This is evident in *Figure 2*, compiling the number of employed people by gender and industry:



Fields requiring physical labour, like “construction, manufacturing and agriculture” are dominated by men, while fields like “financial and insurance activities, accommodation, food

³¹ Statistics Greenland, *Highest Educational Attainment by Gender, 2021, Statistics Greenland, 2021*, <https://stat.gl/dialog/mainTheme.asp?lang=en&sc=VM&tname=t1>.

³² 1. Statistik Grønlands, *Goal 5: Gender Equality, 2021, Statistics Greenland, 2021*, <https://stat.gl/dialog/mainTheme.asp?lang=en&sc=VM&tname=t1>.

service activities, and public administration/service” fields have more women influence. Although there is no cruise section, direct tourism industries, like food, accommodation, and travel insurance companies are seen by women. This lowers **gender inequality**, and even **income inequality**, as seen from the decline in the Gini Index from 35.4 in 2015 to 34 in 2021³³, which is crucial in transitioning to a developed nation. Gini Coefficients are measured on a scale from 0 to 100, where 0 means complete income equality while 100 means complete income inequality.

Rie described that Greenland has three different “tourism-education” programs: The Service Management Program (available for more than 20 years), The Arctic Guide Program (since 2013), and the Adventure Guide Program (2016). The “Adventure guide is getting [particular] attention as adventure tourism [develops] in Greenland. [These] guides require a lot of reading, [taking] 13...exams, and it is often tough, which is why it was intended for men, but there are a lot more women in the field than men.³⁴” Since the guide is just starting, it shows the proportional growth and development.

This stands out to the theory about tourism helping to develop infrastructure reduce inequality and increase productivity. These students are paid monthly to study and have new dorms accessible to them and their families, proving that the nation prioritizes the education of its students, ultimately showing how rapidly Greenland is being modernized due to tourism, cruises being a contributor.

³³ 1. Statistik Groølands, *Goal 10: Reduced Inequalities*, 2021, *Statistics Greenland*, 2021, <https://stat.gl/dialog/mainTheme.asp?lang=en&sc=VM&tname=t1>.

³⁴ Ibid, 14

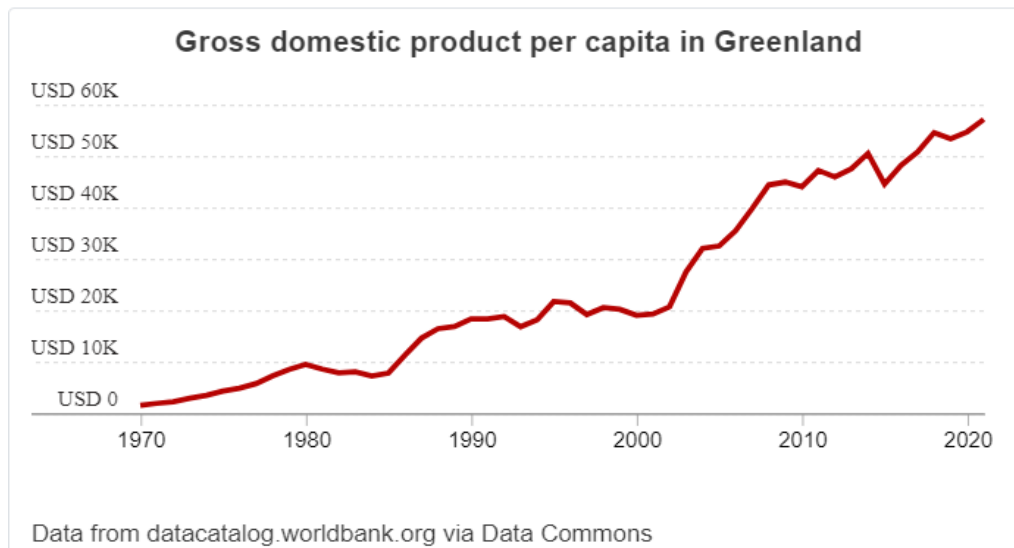
Recently, the tourism department has also opened two international projects: the Arctic Education Alliance (started 1 year ago), a cooperation with the University of Southern Maine that brings teachers to Qaqortoq and students to Maine for teaching and job training, and the Nordik Project (started 1.5 years ago), which talks about the safety in the adventure guide program. This can strengthen international trade and produce an increase in short-term and long-term infrastructure and technology, which benefits the population.

Moreover, guides in Greenland are expensive and this stems from the **inelastic** demand to have local 'authentic' guides rather than foreign guides although they may be cheaper. This creates a type of monopoly over these guides, allowing for higher prices to be charged, thus prompting **demand-pull inflation**, where output and prices rise simultaneously, showing that development and growth can work together. This ultimately recognizes that cruises are creating demand in the education sector and is helping the growth of the population. Additionally, as the government invests in constructing three new airports for 2024 (predicted), they demand 400 people to have an education and be prepared for the professional Greenlandic workforce in the tourism segment alone, reiterating that growth does have some correlation to development.

4. Living Standards

The biggest concern regards whether money is truly being spent to help the people and the cruise industry so that it can thrive to its full potential. This is paramount as living standards investigate infrastructure establishment and poverty, concluding whether the people and the land can handle so many tourists. According to the HDI and *Graph 1*, there is a rapid increase in average income per person, allowing for these feelings of wealth.

Graph 1: Real GDP per Capita in Greenland up to 2020³⁵



From *Table 5*, the escalating final demand in 2016, which has grown by 4.7% from 2015³⁶ causes AD to increase. The increase in government spending can be correlated with the money being received, although it cannot be interpreted whether from cruises themselves or not.

Table 5: Supply and Demand (Expenditure Method) Making up GDP from 2016-2021

	2016	2017	2018	2019	2020	2021
GDP	18 224	18 829	19 296	19 990	20 169	20 344
Imports of goods or services	8 214	8 193	9 745	10 225	9 428	10 114
Supply	26 438	27 022	28 042	30 215	29 597	30 458
Household consumption	6 828	6 928	6 943	7 005	7 116	7 289
Government consumption	7 717	7 986	8 325	8 755	8 820	9 178
Gross investment	4 464	4 446	4 195	6 251	6 410	6 782
Exports of goods or services	7 429	7 662	8 578	8 205	7 251	7 209
Final demand	26 438	27 022	28 042	30 215	29 597	30 458

³⁵ 1. "Greenland," Greenland - Place Explorer - Data Commons, 2021, https://datacommons.org/place/country/GRL/?utm_medium=explore&mprop=amount&popt=EconomicActivity&pv=activitySource%2CGrossDomesticProduction&hl=en.

³⁶ 1. Greenland Statistik, "Greenland in Figures - Stat," Greenland in Figures, May 2023, <https://stat.gl/publ/en/GF/2023/pdf/Greenland%20in%20Figures%202023.pdf>.

Despite this, at least 25% of people living in settlements cannot access basic emergency health care and education (commented by Rie). Although *page 16* reveals lower income inequality, this could also be a result of citizens populating Nuuk, the capital city, where most opportunities are found. Contrastingly, many settlements are inhabited and closed because it is unaffordable to operate them. Theoretically, cruises are supposed to help with this, as cruises visit these secluded towns, but for that to happen, these settlements need to be near land and need robust infrastructure development needs to be initiated. For example, “Ilulissat, the number 1 tourist destination... [has no] public toilet. Sometimes they have a public toilet, but it is funded by the local municipality which has little money, so it is just a horrible bag toilet with a curtain made of plastic”³⁷. The public is hoping that the government spends tax money on developing parts of the land, and infrastructure, but there is no real “responsibility to drive it back to the towns that are dealing with cruise tourism and need it.” This lack of infrastructure proves undeveloped areas and inadequate government spending. This allows for the understanding that for genuine development, genuine growth needs to occur, and so even though the government is getting the money, they are **choosing** to allocate their resources elsewhere, meaning that the cruise industry will not be able to thrive.

Conclusion:

The argument proposed is that cruise ships would benefit parts of the economy directly correlated with economic growth like living standards, and employment, while hurting other parts of development, which can lead the industry to eventually collapse and become like Iceland. As

³⁷ Ibid, 7

growth advanced and exchange rates soared, inflation was brought in many sectors, while output also improved. This allows for greater employment opportunities and efficiency, showing proportionality between cruise spending and economic growth.

Ultimately, HDI is a great indicator of development, but there are limitations discussed as it does not give a genuine measure that is addressed by cruise ships, or by immediate globalization in general.

Table 6's summary shows how the benefits outweigh the disadvantages, allowing for the conclusion that cruises ultimately have a more positive impact than a negative impact on the economy. It is also important to acknowledge the development being done to at least address these problems. For instance, it was previously mentioned that the government is building three airports. According to Rie, this will solve many problems associated with over-tourism, where the 'concentration' of tourists will decrease, and settlements that are farther away from ports can find ways to also integrate themselves.

Table 6: Summary of Advantages and Disadvantages Cruises Have on Economic Development of Greenland

BENEFITS ✓	DISADVANTAGES/ NO IMPACT ✗
Improves mental health, as community engagement rises when preparing for cruises	Negative externalities on the environment.
Permits locals to share culture and language	Municipalities do not see much infrastructure development that can help them earn money
Greater incentive to be educated in fields that require more education (higher education)	Settlements without cruise tourism experience lower income, moving into Nuuk (escaping income inequality)
More women entail lower gender inequality	Over-tourism, (inadequate infrastructure)
Foster greater international relationships, allowing for new technology and knowledge	Opportunity costs make development stagnant
Provides students/individuals with summer jobs and seasonal employment (experiences)	

This conclusion is based merely on the economic theory conducted and the arguments from my essay. Hence, many assumptions were made about Greenland's cruise model. Most primarily, the essay does not account for foreign involvement in the growth of the economy. It is possible that many of these women working in Greenland and individuals who are getting these jobs are international profit-seeking companies and all the taxes that regular citizens must not fully apply to these companies. Cruise ships often create their excursions and become based in these cities, creating a **monopoly** over the whole tourism industry there. Then, development efforts would shrink.

This extended essay provides a fulfilling insight of the correlation between quantitative and qualitative growth and peaks the question: "Will Greenland ever be able to develop off of a tourism industry?". Personally, the answer is no, due to its geographical location and the expense it takes to reach there. Consequently, due to the same reason, it is difficult to expect Greenland to rapidly grow like other countries. With a low population density, a **scarcity** of resources, and an **inelastic supply**, many uncontrollable factors make Greenland unique.

Upon glancing at the disadvantages, is apparent that these are issues that can be solved with awareness and societal efforts rather than large injections of money into the money. For example, instead of charging multi-million companies who remain unaffected the extra money and realizing that global warming can allow them to travel more to this excluded destination, what are some inexpensive ways one can tackle the same problems? In economics, nudges and supply-side policies are of great value because they promote and encourage safe and positive behaviours, rather than focusing on money; this same psychology can be implemented to solve many problems, as tourists often want to help these places.

Sustainability:

Nudges are the most immersive and cost-efficient ways to change consumer habits in spending and environment while allowing people to learn about the culture they travelling to, something many passengers often forget to consider. Elizabeth³⁸ notes smaller ships like “expedition ships” with “max 400 people... have a bigger focus on sustainability,” as they are more expensive and are run by smaller cruise companies rather than larger cruises. She developed two nudges; one where she partnered with expedition cruises and gave out roughly 1059 vouchers to the cruise passengers, half of whom received information regarding the culture and products in Greenland, whereas others did not. It was discovered that “passengers who did not receive sustainability information spent on average 1227.82 DKK while those who did spend on average 1927.63 DKK”, showing real growth. This solution brings revenue and creates desirable **demand-pull inflation**.

The second nudge addresses environmental concerns by encouraging humans to stay on track and discourage environmental using a tourist pledge. This can be done by having passports and pledges that one needs to commit to upon signing it (was mandatory). 530 people were given GPS tracking, as well as the reasoning behind implementing this rule. It was calculated that 6% of people went off the trail when they had no pledge, while merely 4% of people went off the trail with the implementation of a pledge. Those who signed the pledge were less ignorant and quickly went back on the trail, showing commitment and awareness, which helped the environment.

Both are effective and can truly help Greenland stand out in the best ways possible.

³⁸ 1. IB Student, Greenland Sustainability of Cruise Ships Interview, personal, October 16, 2023.

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Appendix A

Condensed Transcript of Interview with Rie Oldenburg, the Head of Education at Campus Kujalleq, Qaqortoq (Conducted September 15, 2023)

Method: To comprehend the interview, the meeting was recorded, and the answers were noted down afterwards in bullet form to avoid repetition or unnecessary information.

Q: What is the guide program, when did it start and what was the rationale behind these programs?

A: There is an increase in tourism, not lots of winter tourism; not as a guide or business (can only get work during holiday and then they go study university or work at the office. Quite a lot of them become skippers (they drive boats).

Adventure Guide longer employment if they move around in the country, they can work for longer seasons. There are three educations offered:

- A. Service Management (more than 20 years)
- B. Arctic Guide (2013)
- C. Adventure Guide (2016): "Adventure guide getting attention. City guides require a lot of reading. 13 tough exams, and it is often tough, which is why it was intended for men, but there are a lot more women in the field than men." There are 22-24 students in these guide education programs.

Q: How popular are these programs? Has popularity increased through the years?

A: "As time has shown, tourists want these authentic guides. They want our guides because it is their own culture. Therefore, the companies are eager to employ them" (before, they would often prefer to employ people from abroad who would often be cheaper because they would come to have the experience. "We can't provide enough yet (resources, equipment, land, etc.)"

Q: What are the expected years of education/ what are the dropout rates in education?

How many people take the guide education courses every year?

Has this number increased? What are the problems and changes to the education system in Greenland?

A: "We make 1-2 classes every year and get support money - students are paid monthly to study. Education is expensive to our society. We get public money to finance education twice as much for adventure guides.... The most expensive in Greenland. Guides' teachers are coming in from all of Greenland, from the trades, from the university. And then they teach the topic We don't have educated teachers enough... And you must be aware of the fact that young people studying/going to high school, will move away from home. "Guides' teachers are coming in from all of Greenland, from the trades, from the university. And then they teach the topic "Don't have educated teachers enough" If you come from small settlements where you don't have any Danish teachers and enter a system where most of the teachers are Danish, then it's very difficult for you they can't have educated teachers, and then you would have to hire people that don't have proper education."

In the 1950s... the Danish government decided Greenland was to become more modern and they sent a lot of Danish teachers to Greenland and the teaching language became Danish. This is still an issue today even if we in the guide education use more English than Danish. (language barriers from Danish to English). There are many problems with primary schools. You don't have enough educated teachers. You have too many lessons that are cancelled at the primary school because teachers are not there. The ability and the will to work is not always high - you are paid your salary even if you don't show up. If they can't have educated teachers, then you would have to hire people who don't have proper education.

Q: Question(s): Are there new development projects in Greenland? (e.g. buildings, museums, hospitals, tourism buildings, roads/airports, etc.).

A: GL is not a member of the EU, but they still get money through the OLT support. The government is "Investing huge amounts of money for improving dorms for our students. [Greenland] doesn't have the infrastructure for a lot of people and doesn't have the facilities to accommodate a lot of people. They are also building more airports in larger towns. The structure will be changed, and capacity will be enlarged and instead of all flights concentrated in a few international airports, you'll have smaller flights in more cities and then have them [tourists] spread over the country more (eliminates over tourism in a way) but then you must develop the facilities locally to have something to offer. With the new airport in 2024 or perhaps later (predicted 2024), we should have educated 400 people to have a professional Greenlandic workforce (in tourism alone). We have done that, but not all of them are using their education (don't get full-year employment or don't commit to the job)

Campus Kujalleq's tourism department takes part in two international projects.

1. Arctic Education Alliance = started last year; This is a cooperation between the University of Southern Maine that will bring teachers to Qaqortoq and students to Maine for teaching and job training.
2. Nordik Project: safety in adventure guide program. Started 1.5 years ago, (Greenland decided to sign up and join. The funding comes from Nordic countries.

Appendix B

Condensed Transcript of Interview with Elizabeth Cooper, a PhD fellow researching sustainable tourist behaviour in Greenland (Conducted October 16, 2023)

Q: How have cruise ships impacted the economy (and society) of Greenland from the past to the future (in a notable manner)?

A: It doesn't have a simple answer or maybe we don't know the answer yet because it is extremely complicated. How you calculate the economic impact of tourism is also up for debate. Like what do you include? Do you only include passenger taxes, or do you also include what people spend in those destinations and how do you track what people spend in those destinations? Some people you will speak to will say that cruise tourism is the worst because they just rock up in the towns and they walk around and they don't spend anything, and then some people have positive experiences of cruise tourists spending a lot of money on gift shops, restaurants and activities and stuff. The difference in opinion is attributed to different types of cruise tourists. You have adventure expedition cruises, and they are normally smaller ships with max 500 people typically the companies that run them have a bigger focus on sustainability, so they try to use local providers in the destination. They try to encourage their passengers to be culturally sensitive to spend money on the destinations and to learn about the destinations more than for example, the big ships do. There is also a question about where the tax money goes. Whether it goes into the destinations that host the cruise ships or whether it just goes into the government, and they use it for something else. I think that is one of the big debates around economic development. Destinations often feel like they are not seeing the tax money from cruise tourism.

Q: What are general beliefs in society as to where the tax money goes? (based on news or society)

A: I think the general impression is that the government (the central government of Greenland) kind of just absorbs the tax money and redistributes it for any purpose rather than putting it into the destinations in the capacity that could help with cruise tourism development. For example, Ilulissat, it's the number 1 tourist destination in Greenland, and there, at the cruise harbour, where all the cruise passengers come in, they don't have a public toilet. Sometimes they have a public toilet, but it is funded by the local municipality which has very little money, so it is just a horrible bag toilet with a curtain made of plastic. You are charging people thousands and thousands of dollars to come to this kind of "exclusive destination, and then you are presenting them with this public toilet which is kind of embarrassing. That's the sort of thing that people are expecting the tax money to be available to provide suitable facilities for the cruise tourists. The tax money is just seen by the government as more money for them to do something with. There is no responsibility to drive it back to the towns that are dealing with cruise tourism and need it.

Q: What are some problems that are being brought up by cruise tourism? For cruises themselves, like when they come to these ports. What are the problems that locals are facing?

Just local infrastructure and local facilities in general, are connected to the management of tourist flows. A lot of the roads in Greenland towns don't have pavement so when you get a lot of people coming off the ship, they are without a direct and clear direction of where to walk. They walk all over the roads, and that can be annoying for local people. Connected to that is the management of numbers, there is no kind. "There is a maximum number of ships that can physically anchor or dock in the port but there is NO official

cap on the number of people who are allowed in each call at one time". If you look at the number of passengers on many of these ships compared to the number of residents in most Greenlandic towns, the difference is huge. A lot of people feel there should be better and more clear management of tourist numbers and tourism flow. How many people can be in a specific place at a specific time?

Q: How is sustainability being brought into cruise tourism? What is being done to make sure that it is sustainable?

(focus on the behaviour of cruise tourists and how they can make their behaviour more sustainable). what are the kinds of tourist behaviour that we can consider to be sustainable and how can we encourage and promote those behaviours more. I have taken a very holistic view of sustainability (social cultural and economic aspects as well) and have identified some behaviours I did two kinds of behavioural field experiments to see if I can increase those behaviours in the cruise experience.

Where I tried to encourage tourists to spend more money on locally sustainable and made products. For example, things made from seal skills and muskox fur. The money goes starting back to the local community.

What I provided cruise tourists with information about why this product is sustainable; the strategy was basically to explain why it's sustainable and how things work in GREENLAND I was looking at the consumer level. You can create change through these interventions and then there is the policy level (what kind of rules and regulations is the government putting in place to make it sustainable and then there is also this supplier level so what are the cruise companies doing, I am sure that there are a lot of initiatives that are being placed on those levels as well. [from the experiment it was found that:]

- Passengers who did NOT receive the sustainability information spent on average 1,227.82 DKK each.
- Passengers who DID receive the sustainability information spent on average 1,927.63 DKK each.
- This is a statistically significant difference, which means that we can conclude that the sustainability information made passengers spend more money in participating shops than they otherwise would have.

I have spoken to a lot of cruise companies, and I know that... These companies give the impression that they care very much about sustainability but how much... is it just a business strategy, no one knows. They are aware that consumers are looking for more sustainable options these days (they are doing this to retain their market share).

Q: The cruise ships you talked to, were they expedition cruises or were they larger cruises?

- Mainly expedition. The ones that participated in my experiment were all expeditions. None of the bigger companies were interested (maybe that says something about the different types of ships and what their priorities are).

Appendix C

Spending of Crew Passengers From 2015 till 2023

(using the Consumer Price Index) in DKK

Table 7

Item	Spending in 2015	Spending in 2023
Food and Beverages	92.91	100.81
Clothing	158.75	172.24
Watches + Jewelry	132.28	143.61
Local Crafts + Souvenirs	200.50	217.65
Other Purchases	61.81	67.11

Appendix D

Educational Attainment Data of Individuals in Greenland Ages 16-74, and the correspondence to the approximate number of years represented (and sample calculation).

Table 8

Type of Education	2015 ³⁹	2022	Cumulative Number of Years of Education ⁴⁰
Lower secondary education	26 371	25 250	10
Upper Secondary Education	1960	2115	14
Vocational Education	7690	8508	20
Bachelors, Professionals Bachelors, master's and PhD Education	3715	4044	21+ (expected = 25 years)
Total Number of People	39 736	39 917	

2022 Relative Abundance (Mean) Calculation:

$$\text{mean years of schooling}^{41} = (0.63)(10) + (0.0530)(14) + (0.213)(20) + (0.101)(25)$$

$$\text{mean years of schooling} = 13.79\text{years} (\approx 13.8 \text{ years})$$

Assumption Made: The number of years is approximate as people may obtain more/fewer years if they took extra courses, skipped/repeated grades, or taken degrees with different lengths.

³⁹ 1. Statistics Greenland, "Educational Attainment (16-74 Years) by Unit, Age, Level of Education, Municipality, Gender and Time," Statbank, September 4, 2023, https://bank.stat.gl/pxweb/en/Greenland/Greenland__UD__UD40__UD4020/UDXISCPROH.px/.

⁴⁰ 1. "Greenland in Figures," Grønlands Statistik, 2023, <https://stat.gl/dialog/topmain.asp?lang=en&subject=Education&sc=UD>.

⁴¹ The decimal values (ex. 0.61) are calculated as the ratio of people (out of 1) from the population who have completed a certain level of education. 0.61= 61%