Issue #04—March 2020

BUSINESS INDEX NORTH

– A periodic report with insight to business activity and opportunities in the Arctic

Sustainability in the Arctic regions: what, how and why?

Contributing authors and organizations

Alexandra Middleton
Assistant Professor,
University of Oulu
alexandra.middleton@oulu.fi

Anders Hersinger
Professor,
Luleå University of Technology
anders.hersinger@ltu.se

Andrey Bryksenkov
Deputy Director of representative office
«Russian State Hydrometeorological
University» in Moscow
ets-spb@mail.ru

Andrey Mineev
Researcher, High North Center at
Nord University Business School
andrey.mineev@nord.no

Elena Dybtsyna
Associate Professor,
Nord University Business School
elena.dybtsyna@nord.no

Erlend Bullvåg
Dean,
Nord University Business School
erlend.bullvag@nord.no

Jaakko Simonen
Professor,
University of Oulu
jaakko.simonen@oulu.fi

Ossi Pesämaa
Associate Professor,
Luleå University of Technology
ossi.pesamaa@ltu.se

Peter Dahlin
Assistant Professor, School of Business,
Society and Engineering,
Mälardalen University
peter.dahlin@mdh.se

Sissel Ovesen
Senior Advisor
Bodø Science Park
so@kpb.no

Project partners

Consortium partners responsible for R&D and technical work related to the production of BIN report:

Expert partners contributing to strategic development of the BIN project:

Basic funding provided by:

Norwegian Ministry of Foreign Affairs

Nordland County Council

Acknowledgements

We gratefully acknowledge the basic funding for the BIN project provided by the Norwegian Ministry of Foreign Affairs (through the Arctic 2030 program) and Nordland County Council (through the DA Nordland program).

We would like to thank our strategic Expert Partners for contributing to the strategic development of the BIN project: The Arctic Economic Council, the Norwegian Shipowners' Association, MGIMO University, Akvaplan-niva, Maritime Forum Nord, the Center for High North Logistics.

Contacts

Chair of the BIN Project Board
Erlend Bullvåg, PhD, Dean at Nord University Business School
Erlend.Bullvag@nord.no
+47 906 49 591

BIN project coordinator
Andrey Mineev, PhD
Researcher at the High North Center for Business,
Nord University Business School
Andrey.Mineev@nord.no
+47 957 26 128

Cover Image
Night hiking in Tromsø for Sustainable development goals, August 2019.
Photo: Ole-Martin Sandness/
Scream Media for Norad

What is BIN?

Business Index North (BIN) is a project that contributes to sustainable development and value creation in the Arctic. The overall goal is to set up a recurring, knowledge-based, systematic information tool for stakeholders such as businesses, academics, governments and regional authorities, as well as media, in the Arctic states. The coordinator of the BIN project is the High North Center for Business and Governance at Nord University Business School (Norway). The project is implemented through the international network of partners from Norway, Sweden, Finland, and Russia. Nordland County Council (Norway) and the Norwegian Ministry of Foreign Affairs provide basic funding for the project.

This is the fourth "Business Index North" periodic analytical report that focuses on sustainable development in northern regions of Norway (Finnmark fylkeskommune, Troms fylkeskommune, Nordland fylkeskommune), Sweden (Norrbottens län and Västerbottens län), Finland (Lapin maakunta, Pohjois-Pohjanmaan maakunta, Kainuun maakunta) and North-West Russia (Murmansk oblast', Arkhangelsk oblast', Republic of Karelia, Nenets Autonomous District, Komi Republic and Yamalo-Nenets Autonomous District). These regions as statistic units correspond to the NUTS3 classification of territorial units introduced by the European Union. Hereafter in our report, we use the English names of these regions without the word "region" from each corresponding language (e.g. Norwegian "fylkeskommune", Finnish "maakunta", Swedish "län", and Russian "Oblast", District, Republic are abandoned).

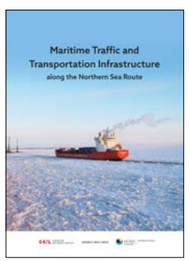
These regions are referred to collectively as the "BIN area" (figure on the next page). Our definition of the BIN area correlates with the EU concept of a macro-region[1]. The BIN area runs across national borders has common characteristics and challenges. The BIN area can be viewed as a strategic layer across countries for future development and cooperation.

The BIN reports provide a comprehensive analysis of sustainable business development in the European Arctic including the northern territories of Norway, Finland, Sweden, and Russia. The reports are based on statistical data from multiple sources, using scientific methods and provide factual and comparable indicators across a set of topics and geographic regions. The findings of the BIN reports are presented through maps and figures which are easy for most users to understand. You can also use oure online resources at www.businessindexnorth.com.

Previous BIN reports

Our previous reports emphasized the value created by people who live in or deal with the north, their livelihoods and the importance of quality education and job creation. At the same time, successful business activities and economic development are another vital component of value creation, as highlighted in our innovation report. Thus, BIN covers value creation activities beneficial to both individuals and legal entities. In this regard, Business Index North seeks to trace both societal and economic developments in the Arctic and offers a detailed considered view of how these evolve in combination. So far we have produced three annual reports and two special issues.

The first BIN annual report issued in 2017 focused on three large topics: People, Business and Production. The second annual report (2018), in addition to continuing topics of the first report, included chapters on Connectivity and Maritime Transportation in the Arctic. The third annual report (2019) focused on value creation in the north through the development of businesses, society and people, as well as infrastructural conditions such as energy, connectivity and knowledge infrastructure. Maritime traffic and transportation infrastructure along the Northern sea route became a topic of the first special issue (2019). There we have analysed drivers for development of the Northern Sea Route and produced maps showing regional on land infrastructure in the Arctic Europe which is and can be connected to the Northern Sea Route. The second special issue (published at the beginning of 2020) focused on innovative companies in the European Arctic. Based on a detailed study of 63 innovative companies and organizations we present implicit and explicit conditions for successful business development in the Arctic.



[1] An area including a territory from a number of different Member States or regions associated with one or more common features and challenges (EU definition).

	Population in thousands	Density of population per sq. km
Norway	**5328.21**	**17.51**
Nordland	243.39	6.75
Troms	167.20	6.72
Finnmark	75.87	1.66
Sweden	**10230.19**	**25.12**
Västerbotten	270.15	4.94
Norrbotten	250.50	2.58
Finland	**5517.92**	**18.16**
Kainuu	73.06	3.62
Lapland	178.52	1.93
North Ostrobothnia	412.16	11.19
Russia	**146880.42**	**8.95**
Arkhangelsk Oblast (excl. NAOs)	1111.03	2.74
Komi Republic	840.87	2.05
Murmansk Oblast	753.56	5.67
Nenets Autonomous Okrug	44.00	0.26
Republic of Karelia	622.48	4.49
Yamalo-Nenets Autonomous Okrug	538.55	0.85

Executive summary

We measured and analysed the level of sustainable development in 14 regions in the Arctic Europe including Norway, Sweden, Finland, and Russia. The United Nations Agenda 2030 of sustainable development goals was used as a measurement framework. We used 52 indicators selected from the UN framework under criteria of appropriateness and data availability for the Arctic. The indicators were grouped into five interlinked pillars of sustainability: People, Society, Economy, Environment and Partnership.

We see big differences between the north and the rest in the four countries of Arctic Europe. Our analysis shows that the situation in the Arctic areas is better only in case of 21% of the indicators. For 34% of the indicators the situation is the same, and about 45% of the indicators describe a situation in the Arctic areas worse than that prevailing in the respective countries as a whole. Specifically, performance is worse on People, Society and Environment indicators. At the same time, Arctic regions in Norway and Sweden are performing better than their respective countries on economic indicators. At aggregate, with the exceptions of the regions of North Ostrobothnia in Finland, and Yamalo-Nenets in Russia, the Arctic areas lag behind their respective countries in terms of sustainable development.

For a more comprehensive view we developed maps and tables where the performance of the Arctic regions can be compared against each other and the corresponding countries.

People

Economic development in the Arctic does not always translate into an improved economic situation for the local population. In many places experiencing economic growth we observe worrying negative trends in demographics.

Not all regions are self-sufficient in producing local food. At the same time some regions, e.g. North Ostrobothnia, are extremely efficient. Arctic regions can benefit from shared knowledge on the development of sustainable agriculture to support the food security of the local populations.

There are feasible discrepancies in achieving the goal of health and wellbeing for the Arctic population. Higher death rates due to cancer and mental wellbeing require special attention.

The main issues that need to be addressed are the capital-periphery divide, availability of medical services and preventive policies, age structure and educational attainment profile of the population.

The Nordic BIN regions significantly lag behind the overall country averages in attainment of tertiary education . Among the Russian BIN regions, wide discrepancies are observable when it comes to attainment of tertiary education. Since education in it self is important for sustainable development in any region, improved education access should be one of the main focus for increased sustainability in the Arctic.

Gender equality through effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life are not fully realized at either country or at the Arctic regional level.

Demographic trends give cause for concern. In the Nordic Arctic total population growth rate is only one third as rate at the country level. In the Russian Arctic regions the population is declining.

Society

Special attention needs to be paid to improve the safety on roads and to resolve deep underlying societal challenges such as limited availability of jobs, poverty and accessibility of mental health services. Collectively these problems explain elevated violence in the Arctic regions measured in terms of homicide rates.

Arctic societies are experiencing a rapid demographic shift with a decreasing population of children and young adults creating threats to sustainably functioning and resilient societies in the future.

Population of children has decreased in most of the areas of the Nordic Arctic during the last ten years. Conversely, the Russian Arctic regions show diverging trends, e.g. Nenets Autonomous Okrug and Yamalo-Nenets Autonomous Okrug showed a sound increase in the population of children while other Russian Arctic regions experienced either low or negative growth.

Population of the young adults has increased in most parts of the Nordic Arctic but growth remains well below the corresponding country averages, while most of the Russian Arctic regions experienced a decline in population of young adults (20–39 years old). Population of elderly people increased in all Arctic regions.

Economy

The Nordic Arctic regions had a total of 29.3 TWh electricity surplus in 2017. There is a need for efficient local use of electricity produced predominantly from renewable sources. The Nordic Arctic region has potential to become attractive for establishing energy-intensive industries.

Business development measured in terms of stock in active enterprises shows growth in the sector of business activities and real estate, and in the hospitality sector, while the number of manufacturing firms is in decline.

The employment growth rate needs to be increased in most of the regions apart from Yamalo-Nenets Autonomous Okrug. The unemployment situation is very different across countries with challenges persisting in Finland and Russia. And now facing Corona, it is expected to reach record levels in all the BIN regions.

Job creation, increasing innovative potential and fostering knowledge economy should be on the development agendas of the Arctic regions. Most of the Arctic regions, except North Ostrobothnia, lag behind their countries averages in terms of knowledge infrastructure. There is lack of large companies investing in R&D activities.

Environment

Emissions per capita are higher than the respective countries' averages in most of the Arctic Europe regions due to differences in industry structure larger presence of (mining, manufacturing, oil and gas) and climatic conditions. Economic activity conducive to increased emissions needs to be viewed hand-in-hand with wellbeing in the region. It is important to have regionally specific strategies and plans for climate change mitigation that take into consideration all pillars of sustainable development.

Partnership

Macro-economic indicators stimulating partnership: GDP per capita is lower than the respective national averages for most of the Nordic Arctic regions, but growth rate is higher. For Russia there are big differences between regions in terms of GDP per capita. Regions relying more on natural resources have higher GDP per capita. Given the high inequality of incomes this is a trend limiting partnerships.

High level and growth rate of GDP in the regions is associated with overconsumption at the macro-level, which in turn presents problems for environment. Achieving partnerships through macroeconomic stability shall be done in conjunction to human development, sustainable consumption and environmental sustainability.

Contributions and how this report can be used

- The first holistic report to numerically represent SDGs status in the Arctic
- To localize SDGs in the Arctic context with a set of targets and indicators
- To assist in prioritizing of SDGs
- To identify risks and opportunities contributing to global level SDGs
- To identify data gaps
- To provide a framework for national policy-making (as a framework instrument please refer to the summary tables presented in the last section of the report)

BIN's comment on Covid-19 situation in the Arctic

In this report we assessed the sustainability of the Arctic regions before COVID-19 pandemic hit the world. The spread of the virus and efforts to bring it under control will definitely affect sustainability of the Arctic regions. The scale of the impact will largely depend on the existing conditions for sustainability and governments' responses to the crisis. Although COVID-19 was not the focus of this report, the indicators presented in this report along with previous BIN reports will help readers evaluate vulnerabilities and favourable conditions of the Arctic regions that are now facing pandemic outbreak.

Here we seek to illustrate how indicators can be used to assess vulnerabilities and conditions that may potentially weaken the impact of the virus.

The Arctic regions with their low density of population and low urbanization (apart from larger cities in the Russian part of the Arctic) are less exposed to the risk of rapid virus spread. However, there are some places with higher proximity and dense living conditions (i.e. island communities, construction workers settlements) that pose higher infection risks.

Vulnerabilities of the Arctic regions stem from the demographic structure with ageing population and a high proportion of +65-year-olds that are most at risk.

Moreover, high proportion of people with chronic diseases and obesity, and mental health issues create additional risks. Historically, the corresponding death rates in the Arctic were already rather high.

In the report we identified negative growth in agricultural and arable land, meaning higher dependency on food produced elsewhere. In the case of supply chain disruptions, this may have negative impact on food security.

Tourism in the Arctic is likely to be negatively affected due to fall in demand and imposed travelling restrictions. In particular, hotels, catering, restaurants, entertainment and cultural and creative industries would suffer most from the crisis. Additionally, service providers, retailers are to be potentially negatively impacted.

In local communities depending on larger companies, negative impact can be much stronger than in larger cities with distributed economy in the south.

Unemployment in the Arctic regions is expected to increase during the crisis. This will probably strain the Arctic economy. A relative lack of access to capital in the Arctic must be taken into consideration when designing measures for the restart of economic activity.

Broadband access shall be advanced further to meet the demand for remote work and teaching.

As a result of pandemic outbreak as well as restrictions imposed by the governments, the Arctic regions are potentially at risk of high unemployment rates, lowering quality of life, depopulation, and less attractive opportunities for investments. On the other hand side, the Arctic regions are so far better off in terms of infection rates.

In times of the crisis, we need to build partnerships and learn from each other. Countries have different exit strategies and support mechanisms to re-build the economy. Decisions made as part of the rebuilding plan will have long-lasting effects on all aspects of sustainability. We therefore challenge authorities to develop a preparedness plan on how to address interconnected risks and achieve sustainability. Evidence from the Arctic regions can be used for targeted measures to build socially, environmentally and economically sustainable Arctic regions during and after the crisis.

Report approach: A tailored set of SDG targets and indicators at the Arctic level

The United Nations Sustainable Development Goals (SDGs) were introduced in 2015 in order to provide a roadmap to achieve a better and more sustainable future for all by 2030. Altogether 17 SDGs address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice. Each goal has specific targets and indicators that are used to monitor progress towards its achievement. In total, The United Nations defined 169 targets and 231 indicators. Understanding of how SDGs are achieved at the Arctic level is crucial for future development.

Why

While SDGs are truly global, their achievement starts from regions and municipalities. Localization refers to the process of selecting, adapting, implementing and monitoring the SDGs at the local level.

What kind

By focusing on SDGs in the local context we use a set of indicators for each SDG to measure and monitor progress. SDGs can provide a framework for local development policy, reflect challenges and highlight opportunities. SDGs provide a language that the whole world understands. By using carefully selected SDGs targets and indicators we localize UN SDGs at the Arctic level. and adopt a 5 pillar approach to be more specific when we identify challenges and need for action.

How

By analysing SDGs achievement, this report uses a set of targets and indicators relevant at the Arctic (BIN area). The report can be used to provide reference in regard to:

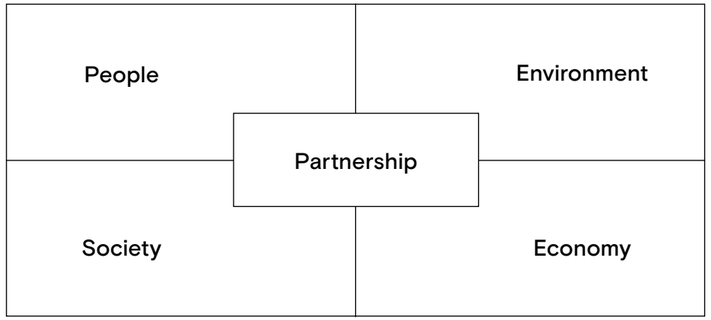
- the overall situation in the Arctic BIN regions regarding various dimensions of sustainability
- the challenges and opportunities regarding each individual SDGs at the regional level
- the performance of the BIN regions compared to the country averages and each other
- which SDGs are currently being achieved and which require more attention?

Framework for SDG analysis in the Arctic

In our analysis we focus on topics People, Society, Economy, Environment and Partnership, each including a set of targets and indicators. We select targets and indicators according to:

1) their appropriateness for the Arctic regions
2) the availability of comparable data on the regional level

5 pillars of Arctic sustainability



Arctic People

This pillar focuses on people with the goals to end poverty, hunger, fight inequality, ensure healthy lives, knowledge & inclusion and the empowerment of women.

Arctic Society

This pillar includes sustainable cities and communities and the peace, justice and strong institutions that are essential for functioning and sustainable societies.

Sustainable Economy in the Arctic

This pillar deals with sustainable business, affordable clean energy, finance and socio-economic development, responsible consumption and production, all of which in turn serve as input for reducing inequalities.
Note: data on SDG 12 is not available on the regional level (hence SDG12 is not included)

Arctic Environment

This pillar focuses on the environment, water and sanitation, sustainable consumption, fighting climate change, includes marine and terrestrial ecosystems.
Note: Data not available for SDG 6, SDG 14 and SDG15
Environmental data are typically spread across a range of agencies and levels of government and information is often compiled for other purposes. While some data is available on the national level, comparable regional environmental statistics are lacking.

Arctic Partnership

This pillar recognizes that the road to achieving SDGs requires new and existing working partnerships for sustainable development.

for Methodology and more details regarding the report approach, SDGs, targets and indicators used, please refer to the Appendix in the end of the report.

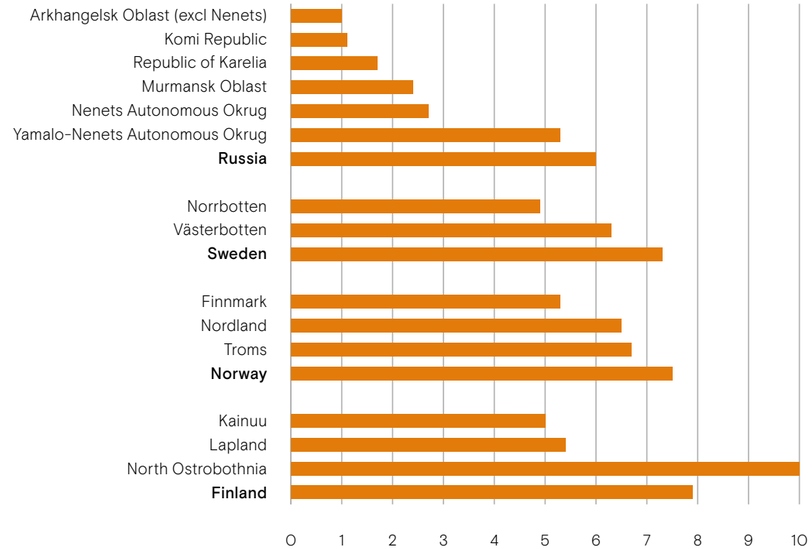
Contents

Arctic People

This chapter focuses on people dedicated to ending poverty, hunger, combatting inequality, ensuring healthy lives, knowledge and inclusion and the empowerment of women. In order to understand Arctic people, we add demographic indicators that reflect changes in human populations on the regional level in the Arctic. Demographic analysis is essential for social and economic sustainability. By analysing demographic trends, we can evaluate the resilience of the Arctic regions to such phenomena as population ageing and outmigration of young adults.

Winners of Bicycling competitions at Barents summer games (Bodø, September 2017)
Photo: Bodø Fotoklubb

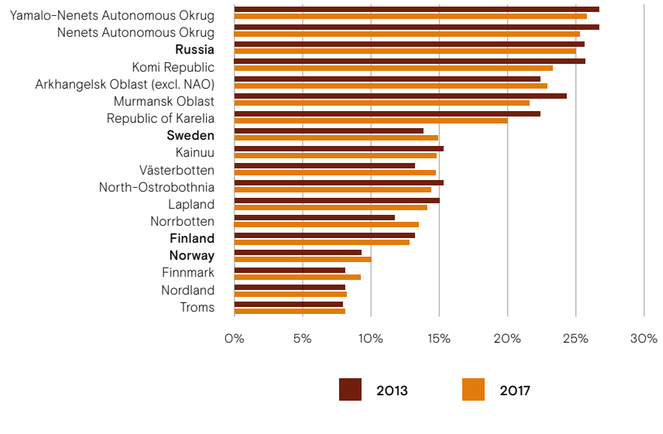
People - Aggregate score for indicators “Arctic People” – the BIN regions compared to their countries averages



Aggregate scores are calculated for a set of indicators presented in the chapter Arctic People. This approach assumes equal weights for the indicators. To calculate scores and compare the indicators across countries and regions we used a standard scaling formula for 1-10 point scale. Higher score means better situation in a particular region, and vice-versa.

SDG 1 — No Poverty

Figure 1.1 — At risk of poverty rates, %, 2013 and 2017



Average poverty rate in the BIN Nordic regions was 12.1% (0.4 lower than in the whole of Norway, Sweden, Finland) in 2017. Regional variation is wide, e.g. in Finland, all BIN regions have a higher at-risk of poverty rate than the national average. Conversely, in Norway the BIN regions are on average slightly better than the national average. The poverty rate in the BIN Russian regions on average was 27.8% in 2017. In the Russian BIN regions, poverty is 2.3 times more prevalent than in the Nordic BIN regions.

The at-risk-of-poverty rate is the share of people with an equivalised disposable income below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income.

Figure 1.2 — At risk of poverty rates, %, 2013 and 2017

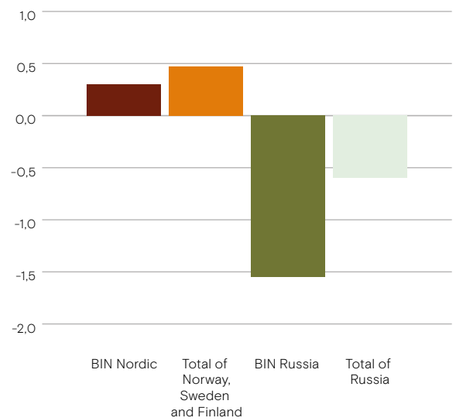


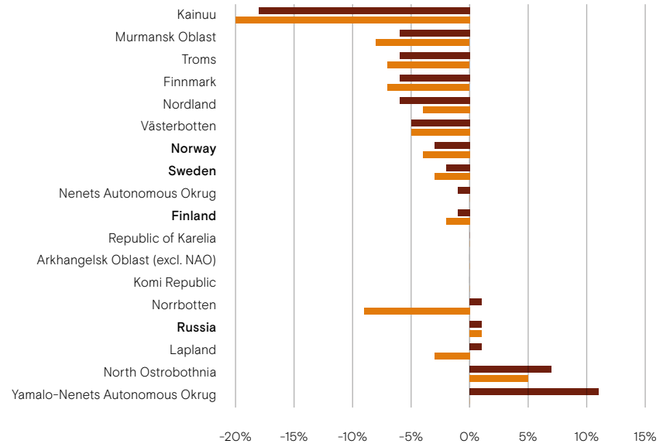
Figure 1.2 demonstrates that the at risk of poverty rate decreased in the Russian BIN regions on average by 1.55 percentage points, while in the Nordic BIN regions it increased by 0.3. The results demonstrate that the policies are not efficient enough to eradicate the poverty risk in the BIN Nordics, in the Russian BIN regions poverty rates are very high despite a slight decrease over for the years under analysis, 2013–2017. Natural resources extraction in Yamalo-Nenets Autonomous Okrug does not translate into well-being in the local population, which has some of the highest poverty risks in Russia overall. The progress is rather slow in achieving SDG1 in the BIN area. The results indicate that the Arctic regions require sound policy frameworks at the national, regional and international levels to support poverty eradication actions.

SDG 2 — Zero Hunger

Investments in agriculture are crucial to increase the capacity for agricultural productivity and sustainable food production systems and are necessary to alleviate hunger.

We have selected indicators that are relevant in assessing food security in the BIN area. Locally grown food is essential to provide long-term food security for communities.

Figure 1.3 — Change in agricultural and arable land area, 2009–2018



Agricultural land in use
Land allocated to the cultivation of crops and animal husbandry.

Arable land in use
The total of areas under temporary crops, temporary meadows and pastures, and land lying temporarily fallow. Arable land is suitable for agriculture, in other words, arable land is cultivated land.

Seven regions (Nenets, Västerbotten, Nordland, Finnmark, Troms, Murmansk Oblast and Kainuu) had an average negative growth (-7%) ranging from -1% to -18% in agricultural land area during the years 2009–2018. Total negative growth in agricultural land in Sweden, Finland and Norway was -2%, and in Russia +1% over the same period. Komi Republic, Arkhangelsk Oblast (excl. NAO) and the Republic of Karelia had zero growth in agricultural and also in arable land. Of agricultural land in the BIN Nordic regions 87% is arable land, while only 32% of agricultural land in the Russian BIN regions is arable land. Growth in arable land occurred only in North Ostrobothnia (5%) and in Russia overall (1%), while in nine regions the decrease in arable land averaged to 9% during the years 2009–2018. Agricultural land is typically land devoted to agriculture. Arable land is a land actually cultivated.

Figure 1.4 — Arable land per 1000 population in sq km, 2018

In Norway, there are no big differences between the country average of arable land (just under 2 sq. meters) per 1,000 population and the BIN regions. In Sweden, Norrbotten has the least arable land per 1,000 population. In Finland, North Ostrobothnia has arable land of 5 sq km per 1,000 population, above the country average. In Russia, Arkhangelsk, Karelia and Komi have similar indicators as the Norwegian regions. Murmansk, Nenets and Yamalo-Nenets Autonmous Region have the least arable land per 1,000. Low numbers are indicative of harsh climatic conditions and the prevalence of permafrost.

Crops are plants such as wheat and potatoes that are grown in large quantities for food. In our analysis we focus on such crops as potatoes and barley, which can be grown in the High North regions

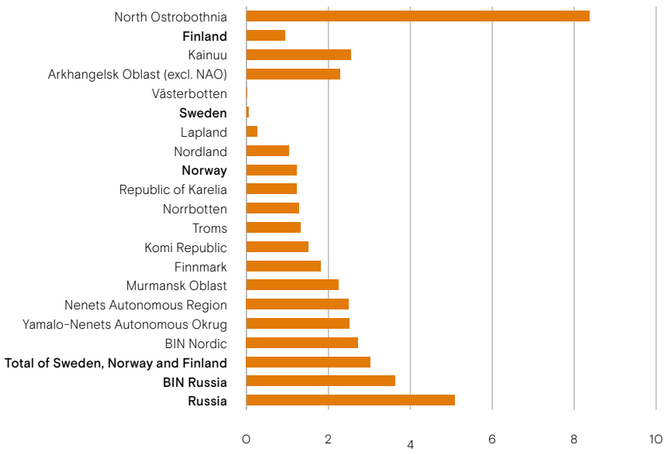


Figure 1.5 — Production of milk, cattle and crops in natural units per capita, 2018

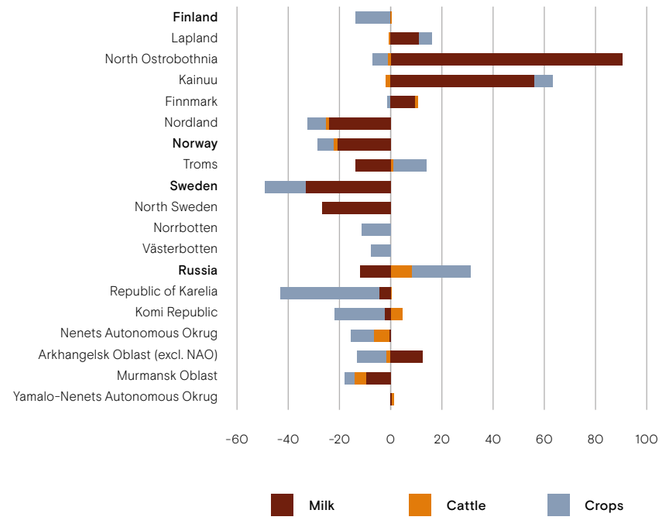
Figure 1.5 demonstrates that some BIN regions have very high levels of efficiency in terms of producing food from agriculture, e.g. North Ostrobothnia and Kainuu are leaders in milk production with three times more milk produced per capita than in Norway, Sweden, Finland and the Russian Federation on average. Production of cattle varies a lot, it is high in Nordland, North Ostrobothnia and Nenets Autonomous Okrug. North Ostrobothnia is the top producer of crops measured as total potatoes and barley. Overall, the Nordic BIN regions are more efficient in producing milk than Norway, Finland and Sweden as a whole, mainly due to the rurality of the Nordic BIN regions. In Russia, all BIN regions produce significantly less milk, cattle and crops than the country average per capita, mainly due to the harsh climate and unavailability of agricultural and arable land.

Region	Milk	Cattle	Crops
North Ostrobothnia	939	31	561
Kainuu	877	20	64
Lapland	512	17	26
Finland	414	16	351
Nordland	420	26	8
Finnmark	268	9	0
Troms	186	8	27
Norway	286	17	144
North Sweden	286	-	-
Norrbotten	-	5	52
Västerbotten	-	10	90
Sweden	262	13	178
Republic of Karelia	98	5	57
Komi Republic	63	12	65
Nenets Autonomous Okrug	77	30	17
Arkhangelsk Oblast (excl. NAO)	109	3	17
Murmansk Oblast	25	2	6
Yamalo-Nenets Autonomous Okrug	4	10	17
Russia	202	38	268
Nordic BIN regions total	498	16	104
Total of Norway, Finland and Sweden	321	15	224
Russian BIN regions total	63	10	30

Note: crops and cattle are measured in kg, milk in litres

Figure 1.6 — Change in production of milk, cattle, and crops per capita, 2010-2018

Figure 1.6 illustrates change in the production of milk, cattle and crops (potato and barley) per capita. The results demonstrate that from 2010 to 2018 negative growth in milk production is observed in nearly all BIN regions apart from Kainuu and North Ostrobothnia. Negative trends in crops production per capita are especially pronounced in the Komi Republic and the Republic of Karelia.



Arctic climate necessitates specialization. Lack of arable land and the small number of crops that can be grown in such High North areas pose challenges to agriculture. Supply of locally sustainably produced agricultural and dairy products is essential for the resilience, health and well-being of the Arctic communities. Negative growth in agricultural and arable land as well as negative trends in the production of major food groups (milk, cattle and crops) per capita creates threats to food security in the Northern regions, making them more vulnerable and dependent on imported food produce. At the same time the analysis demonstrates that in certain regions such as North Ostrobothnia and Kainuu food production (milk) is efficient and higher than the total of Norway, Finland and Sweden, therefore, providing an example of food exporting regions. In the future, data on fisheries and aquaculture would be useful to complement the analysis of food security in the Arctic. given strong presence of the North-Norwegian fisheries and aquaculture industry, and also growing potential of these industries in the North-West Russia.

Thinking ahead, it is important to monitor the impact of extractive industries on the state of agricultural and arable lands in the North and support land (re)cultivation policies. Melting permafrost creates preconditions for increased use of land for agricultural purposes that will be on the agenda when creating policies for achieving SDG 2 and strengthening capacity for adapting to climate change. Indicators reflecting the use of sustainable agriculture on the regional level are needed for the monitoring of SDG2 achievement.

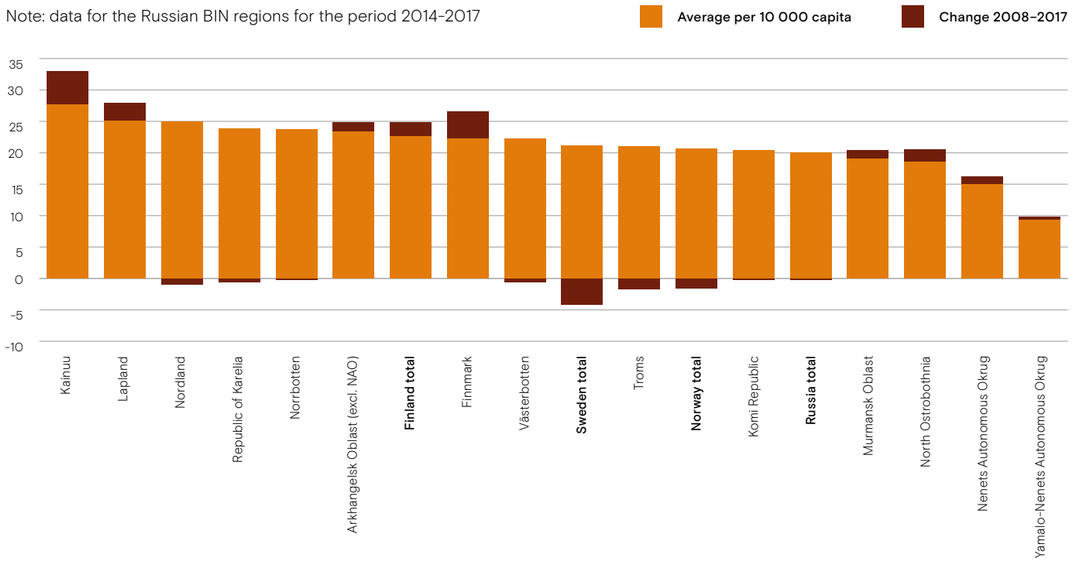
SDG 3 — Good Health and Well-Being

To analyse SDG 3 we chose indicators that reflect health, both physical and mental, and also the well-being of Arctic communities. Selected indicators reflect ageing population in the Arctic and concerns over health care availability and accessibility.

Death rate due to cancer per 10,000 population describes the number of people who die from cancer out of 10,000 people in one year, calculated as the average for 2015 – 2017. Cancer is the second leading cause of death globally. Between 30 and 50% of cancers are preventable by healthy lifestyle choices such as avoidance of tobacco consumption and targeted public health measures. Tobacco and alcohol consumption, unhealthy diet and physical inactivity are a major cancer risk. Ageing is another fundamental factor in the development of cancer.

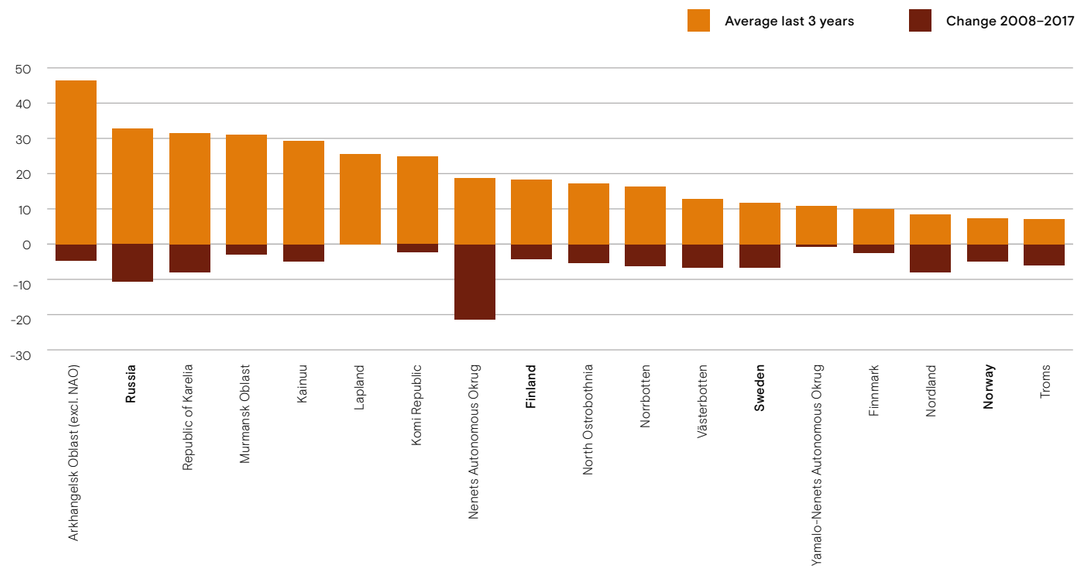
Figure 1.7 — Death rates due to cancer per 10,000 capita, average 2015-2017 and change 2008-2017

Note: data for the Russian BIN regions for the period 2014-2017



The average death rate due to cancer per 10,000 population overall in Sweden, Norway, Finland and Russia was 21.2. In eight regions, namely Västerbotten, Finnmark, Arkhangelsk Oblast (excl. NAO), Norrbotten, Republic of Karelia, Nordland, Lapland, Kainuu death rates were above the national averages of Sweden, Norway, Finland and Russia. In Kainuu death rates due to cancer are as high as 27.6. In the Russian regions of Nenets Autonomous Okrug (14.9) and Yamalo-Nenets Autonomous Okrug (9.3), the lowest death rates due to cancer are observed. High death rates due to cancer are linked to ageing population, one-quarter of new cancer cases are diagnosed in people aged 65 to 74[1]. In regions with the highest proportion of elderly people, there are more deaths due to cancer, e.g. in Kainuu the share of those over 65 was 25.7 % and median age 50.3 years. By comparison median age in Yamalo-Nenets Autonomous Okrug was 33.3 years in 2017. Deaths due to cancer have been on the increase for the last 10 years in the BIN Nordic regions (+1.38), while in Norway, Sweden and Finland overall (-1.17) a slight decrease was observed. Similarly, in the BIN Russian regions deaths due to cancer increased by 0.65, while on average in Russia a decrease of -0.17 was observed.

Figure 1.8 — Death rates due to ischaemic heart deseases per 10,000 capita, average 2013–2017 and change 2008–2017

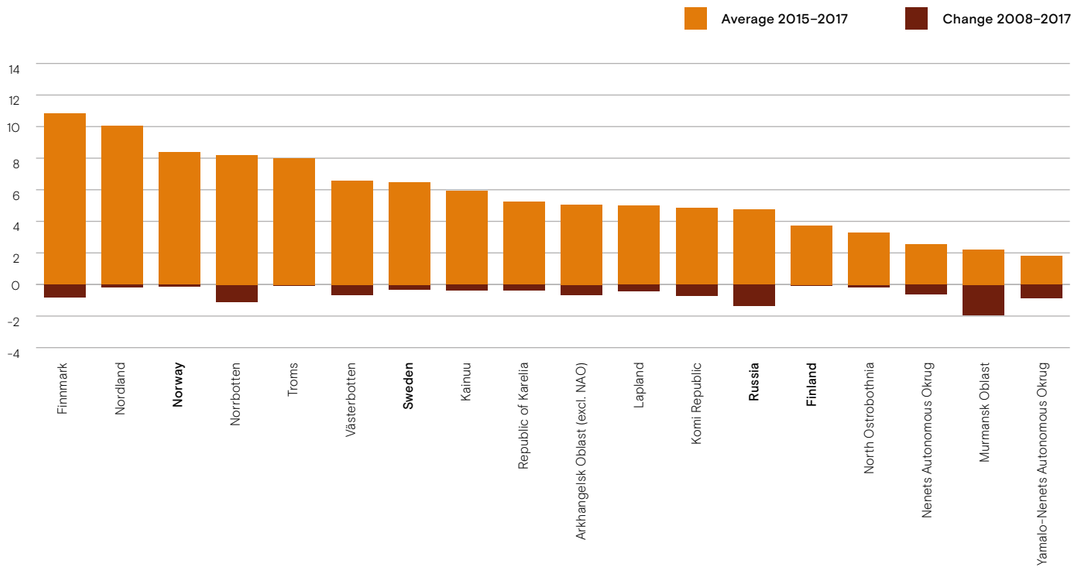


The Russian BIN regions have much higher incidents of deaths due to ischaemic heart diseases than do the Nordic BIN regions. The highest rates are observed in Arkhangelsk Oblast (excl. NAO) with a rate of 44.8 per 10,000 population. In Finland Lapland (25.5) and Kainuu (29.3) have higher rates than the national average of 18.3. In Sweden Norrbotten (16.4) and Västerbotten (12.8) also have higher rates than the national average for Sweden, 11.7. Similarly, in Norway, Finnmark (10.1) and Norland (8.6) have slightly higher rates than the total for Norway, 7.4. While population ageing contributes to death rates due to ischaemic heart diseases, further investigation is needed into the availability of preventive measures, e.g. mapping of hospitals (medical institutions) with Percutaneous Coronary Intervention Centres (PCI) and their proximity to population in the Arctic regions. The trend for the period 2008-2017 indicates a decrease in death rates due to ischaemic heart diseases in the Nordic BIN regions the decrease is on par with the national averages for Norway, Sweden and Finland, while in the Russian BIN regions the decrease is smaller (-6.71) than the country's total of (-10.55).

Deaths due to ischaemic heart disease per 10,000 population. This indicator measures the number of people who die from reduced blood supply to the heart out of 10,000 people in one year, calculated as the average for 2015–2017. This indicator is part of cardiovascular deceases (CVD),which are disorders of the heart and blood vessels. Deaths due to CVD are the main cause of deaths worldwide. According to WHO, major causes of CDV are unhealthy diet, physical inactivity, tobacco use and harmful consumption of alcohol. Underlying causes are globalization, urbanization and population ageing. Other determinants of CVDs include poverty, stress and hereditary factors.

[1] https://www.cancer.gov/about-cancer/causes-prevention/risk/age

Figure 1.9 — Death rates due to chronic respiratory deseases per 10,000 capita, average 2015–2017 and change 2008–2017

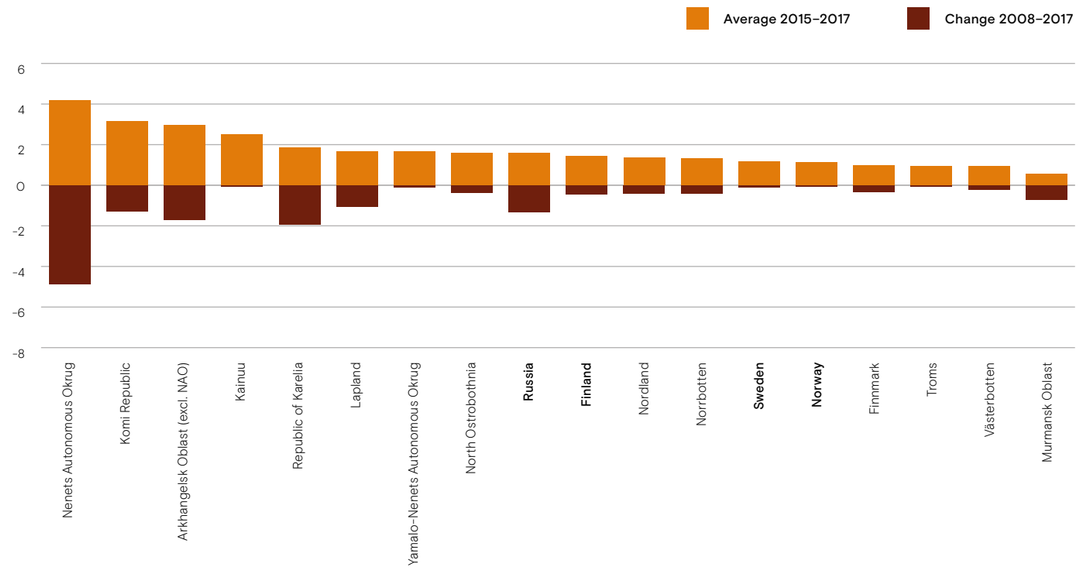


High death rates due to chronic respiratory diseases in Finnmark (10.9), Nordland (10.0) and Swedish BIN regions can be attributed to high life expectancy. The level of education affects the risk as people with primary education attainment only have three times higher risk of chronic respiratory deceases than do people with higher education[2]. Therefore, while ageing population explains higher death rates due to CRDs in the Nordic BIN regions, a more systematic mapping of other CRDs risk factors is needed. For instance, data on smokers as percentage of population reveals that in 2000–2010 smoking was on average 12 percentage points more prevalent in Finnmark than in the Oslo region, while in 2010–2018 the differences disappeared.

Death rate due to chronic respiratory diseases per 10,000 population describes the number of people who die from chronic respiratory diseases (CRDs) out of 10,000 people in one year, calculated as the average for 2015 – 2017. Chronic respiratory diseases (CRDs) are diseases of the airways and other structures of the lung. Tobacco smoking, indoor and outdoor air pollution, allergens, occupational risks such as exposure to chemicals and dust and frequent lower respiratory infections are major risk factors for chronic respiratory diseases (CRDs).

[2] https://www.fhi.no/en/op/hin/health-disease/copd/

Figure 1.10 — Death rates due to suicide per 10,000 capita, average 2015–2017 and change 2008–2017



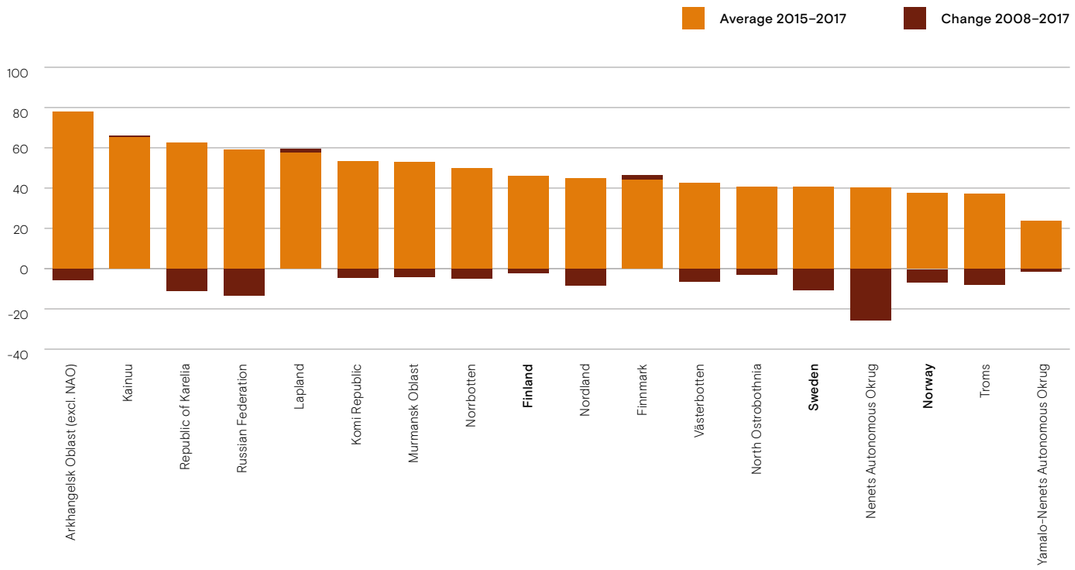
Nenets Autonomous Okrug (4.2) and Komi Republic (3.2) have the highest death rates due to suicide per 10,000 population. The global average was 1.1 in 2016 (WHO) and two times higher among men than among women[3]. Studies from Arctic nations reveal elevated suicide rates among Indigenous populations, with substantial disparities compared to non-Indigenous populations[4]. In the Nordic BIN regions the average death rate due to suicides (1.41) for the years 2015-2017 was slightly higher than in Norway, Finland and Sweden overall at 1.25. despite a slight decline in death rates due to suicide overall (-0.15) some Nordic BIN regions, e.g. Norland, Norrbotten, Västerbotten and North Ostrobothnia, saw growth in suicide rate. While all Russian BIN regions saw a decrease (-2.0) in deaths due to suicide over the last 10 years, the overall rate for the years 2015-2017 was still considerably higher (2.4) than in the Russian Federation overall (1.6). Further studies are needed to establish the reasons for suicides in all regions with high suicide rates. The availability and accessibility of mental health services for vulnerable groups need to be evaluated. Data is required on sex, age-groups and statistics on suicide rates in indigenous peoples. Specific data would help create responses including preventive measures at the individual, community and national levels.

Suicide may occur at any age throughout the lifespan and is the second leading cause of death among 15–29 year olds globally. Suicide rates are used as a mental health indicator.

[3] http://apps.who.int/gho/data/node.sdg.3-4-viz-2?lang=en

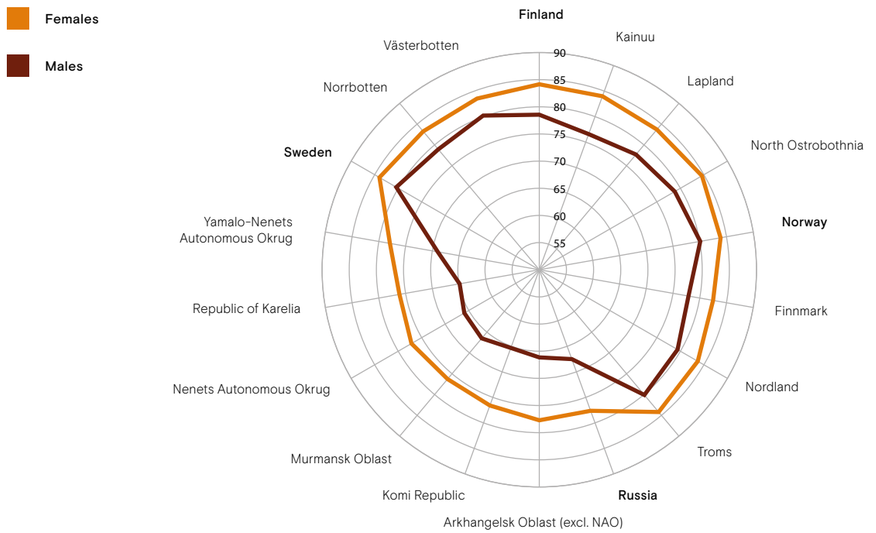
[4] Silviken A. Prevalence of suicidal behaviour among indigenous Sámi in northern Norway. Int J Circumpolar Health. 2009;68(3):204–11; Hassler S, Johansson R, Sjölander P, Grönberg H, Damber L. Causes of death in the Sámi population of Sweden, 1961-2000. Int J Epidemiol. 2005;34(3):623–9.; Soininen L, Pukkala E. Mortality of the Sámi in northern Finland 1979–2005. Int J Circumpolar Health. 2008;67(1):43–55.

Figure 1.11 — Total death rate due to ischaemic heart disease, cancer, chronic respiratory diseases and suicides, average rate for 2015–2017 and change 2008–2017*



Overall, Arkhangelsk Oblast, Kanuu and the Republic of Karelia have the highest death rates overall, while Troms and Yamalo-Nenents Autonomous Okrug have the lowest total death rates. In the Nordic BIN regions total death rate equalled 47.7 while in total of Sweden Norway and Finland it equalled 41.4. In Russia total combined death rate is 59.1 with big discrepancies among regions, e.g. Yamalo-Nenets Autonomous Okrug had a combined death rate of 26.1 compared to Arkhangelsk Oblast without NAO, where it amounted to 75.

Figure 1.12 — Life expectancy at birth, 2017



In the Russian BIN regions average male life expectancy at birth is 66.3 years compared to 78.7 in the Nordic BIN regions. For females, in the Russian BIN regions, average life expectancy is 77 compared to 83.7 in the Nordic BIN regions. Within the Nordic BIN regions the gap between females and males is on average 5 years, with shorter life expectancy for males. Within the Russian BIN regions the gap between females and males is on average 10.7 years shorter life expectancy for males. During the last 10 years Russia had a postive life expectancy trend. Men's life expectancy was shorter in the Nordic BIN regions by 1 year compared to the total of Norway, Sweden and Finland and by 1.2 years in the Russian BIN regions compared to Russia's total. There were no significant differences between female's life expectancy in the BIN regions and corresponding country averages.

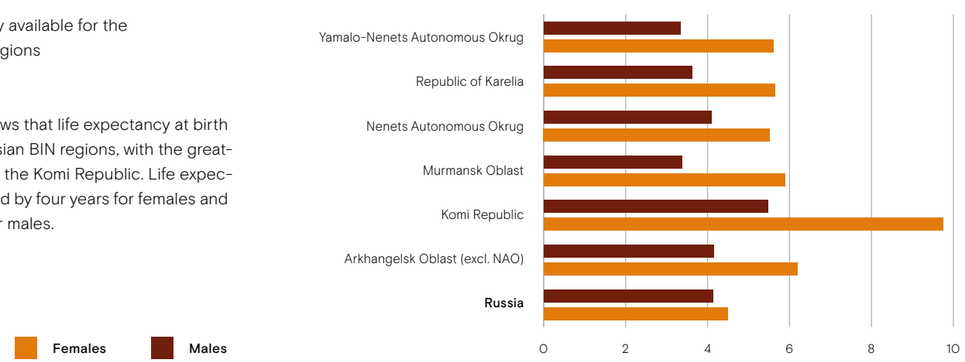
Poverty and education levels should be considered in conjunction with the interpretation of these numbers. Healthcare provision systems play an important role in promoting longer life spans. Furthermore, we need an understanding of the major environmental risks to health in the Arctic regions defined as all the physical, chemical and biological factors external to a person. e.g. pollution of air, water and soil, occupational risks, built environments, climate and ecosystem change risks.

Life Expectancy at birth (years) in 2017 refers to the mean number of years a new-born child can expect to live if subjected throughout his or her life to the current mortality conditions. Life expectancy is influenced by many factors such as socio-economic status, including employment, income, education and economic wellbeing. Improvements in the educational attainment levels of the population contribute to improvements in life expectancy.

Figure 1.13 — Change in life expectancy at birth, by sex, 2008–2017

Note: data only available for the Russian BIN regions

Figure 1.13 shows that life expectancy at birth rose in all Russian BIN regions, with the greatest increase in the Komi Republic. Life expectancy increased by four years for females and by six years for males.



SDG 4 — Quality Education

Education affects individuals' quality of life in many ways; it predicts employment opportunities, earning potential and reduces the risk of poverty. The level of education is fundamental in predicting individuals' health and life expectancy.

Figure 1.14 — Tertiary education attainment among 25 to 64 year-olds population, %, 2015–2018

In 2018, Nordic BIN regions had tertiary education attainment of 39.9% which is four percentage points lower than in the total of Sweden, Finland and Norway. On average no growth is observed 2015–2018 due to negative growth in tertiary education attainment rates in Norway (3.6 percentage points) and 4.1 percentage points in the North of Norway.

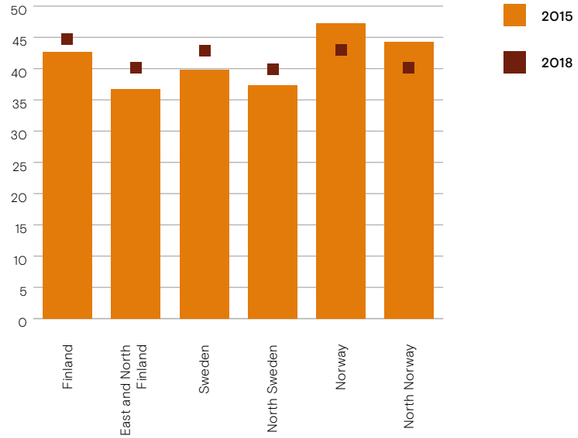
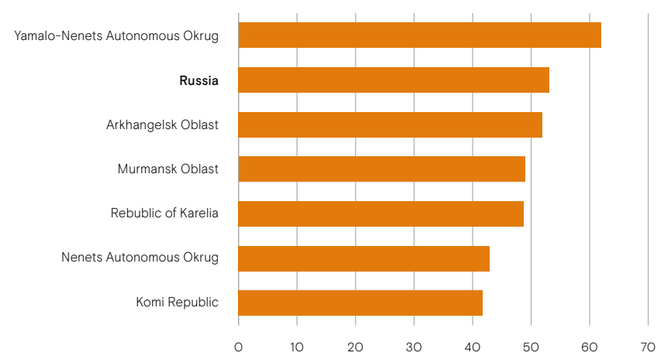


Figure 1.15 — Tertiary education attainment among 25 to 64 year-olds population, %, 2016, Russia

Russia's total average of tertiary education attainment among 25 to 64-year-olds was 53.1% in 2016. According to the OECD, Russia has one of the highest shares of adults attaining tertiary level education out of all OECD and partner countries, which is 19 percentage points more than the OECD average[5]. Big differences are observed in the Northern regions, with the Yamalo-Nenets region outperforming the country average by 8.8 percentage points and the Komi Republic underperforming by 11.4 percentage points. Economic development due to the oil and gas industries in Yamalo-Nenets Autonomous Okrug potentially contributes to the demand for a highly skilled labour force.



[5] Education at a Glance. OECD (2016)

SDG 5 — Gender Equality

Gender equality is addressed by analysing indicators of participation of women in the labour force.

Figure 1.16 — Employment participation rate as % of labour force aged 15–64, by gender, 2017

Note: Total Russia data from 2014, data on regional level in Finland not available

The results demonstrate that women are less likely to participate in employment than men in both Nordic and Russian BIN regions. In the Russian BIN regions, on average, the difference is 7.2% (ranging from 2% in Nenets Autonomous Okrug to 10.5% in Murmansk Oblast), compared to Russia's total of 10.5. In the Nordic BIN regions the difference is 2.7%.

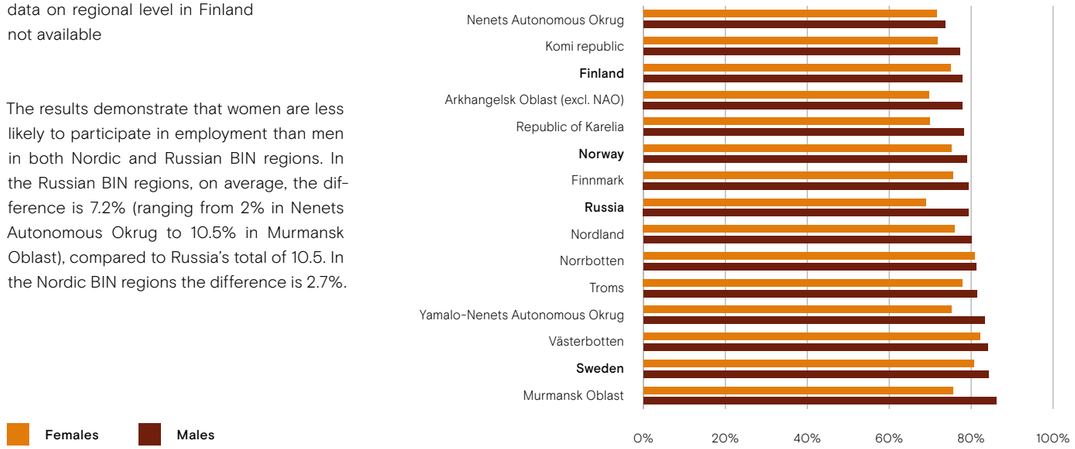
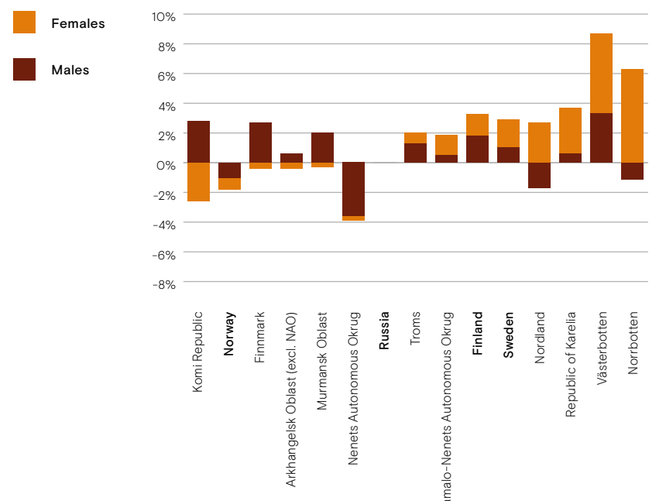


Figure 1.17 — Change in employment participation, by sex, 2013–2017

The trend in the employment participation gap between males and females help us to gauge if women participate more in employment. The gap in employment participation rates increased from 2013 to 2017 indicating a worsening situation for females in the following regions: Murmansk Oblast, Arkhangelsk Oblast, Finnmark and Komi Republic. Some regions have reached nearly equal employment rates in male and female employment participation. Greater female participation in labour force is either due to improved job availability or conditions created (e.g. childcare provision, fewer kids per mother, sharing of responsibilities for child and elderly care between males and females etc.). Hence a systematic analysis is needed of the underlying factors predisposing to greater participation by females in the labour force.



Demographic indicators

Figure 1.18 — Change in total population in the BIN area, %, 2009–2018

Nearly all BIN regions had population growth below the respective country averages. The region of North Ostrobothnia had the same level of population growth as the rest of Finland. Nenets Autonomous Okrug and Yamalo-Nenets Autonomous Okrug had population growth larger than Russia's with an average of 3%. The biggest negative growth occurred in the Russian regions of Komi Republic (-81,448), Arkhangelsk (-93,316) and Murmansk (-51,997) Oblast, Republic of Karelia (-31,282) and in Finnish Kainuu (-6,173) and Lapland (-5,226) regions. In absolute numbers, there were 201,155 fewer people living in the BIN area in 2018 than in 2009.

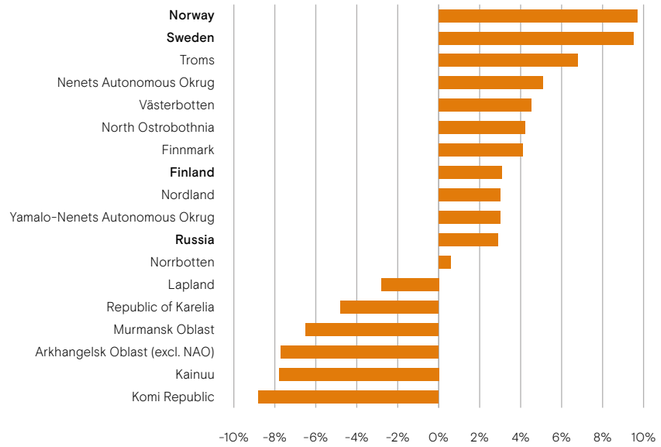


Figure 1.19 — Changes in population incl. Russia, index 2009 = 100, 2009–2018

Measured as index, population change in the BIN regions exhibits a negative trend (-3.48%) for the whole period 2009-2018 while in Finland, Sweden, Norway and Russia population continued to grow with a 3.49% increase. Diverging trends in the Arctic regions and in the southern regions of the corresponding countries create challenges for demographic resilience in the Arctic.

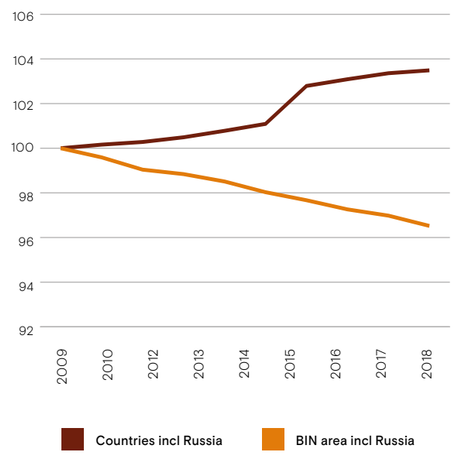
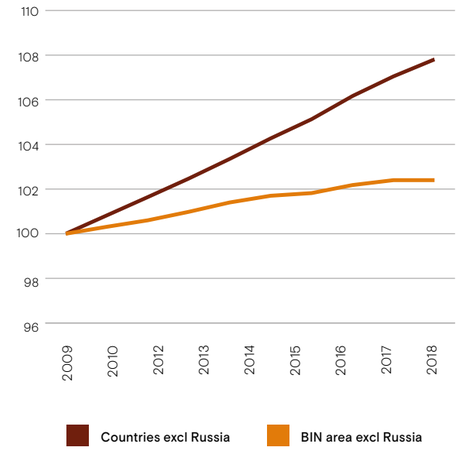


Figure 1.20 — Changes in population excl. Russia, index 2009=100, 2009–2018

Figure 1.20 illustrates changes in population excluding Russian regions most affected by negative population growth. The growth in the Nordic BIN regions is still 3.25 times slower than in Finland, Norway and Finland on average.



Conclusions

Economic development in the Arctic does not always translate into an improved economic situation for the local population. High levels of poverty risk serve as a warning sign that the wellbeing of the local population regarding economic situation and health requires special attention.

In regard to SDG 2, the results demonstrate that not all regions are self-sufficient in producing local food. At the same time some regions, e.g. North Ostrobothnia, are extremely efficient. Arctic regions can benefit from shared knowledge on the development of sustainable agriculture to support food security of the local populations.

There are big discrepancies in achieving the goal of health and wellbeing for the Arctic population. The main factors that need to be addressed are the capital-periphery divide, availability of medical services and preventive policies, age structure and education attainment profile of the population. Increase of death rates due to cancer and mental wellbeing require special attention.

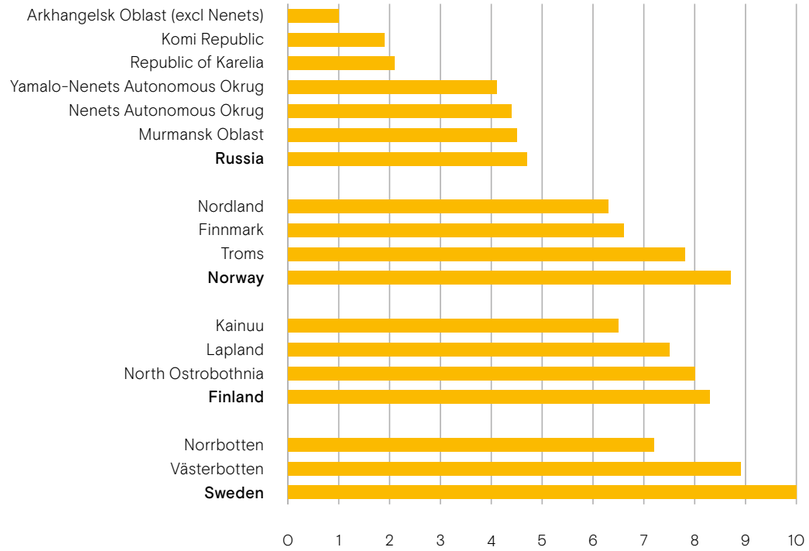
The Nordic BIN regions lag behind the overall country averages in tertiary education attainment. In the Russian BIN regions, big discrepancies are observable between regions in tertiary education attainment. The results demonstrate that gender equality through effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life are not fully realized at either country or Arctic regional level. It is important to understand whether the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility is enough, especially in the regions with widening gaps in employment participation between males and females.

Arctic Society

This chapter includes indicators on sustainable cities and communities and the peace, justice and strong institutions that are essential for the functioning of sustainable societies. Furthermore, we add such demographic indicators not currently part of the SDG framework, but of high relevance to the Arctic. Namely, we include structural demographic indicators such as change in the population group aged 0-19 and in the group of young adults aged 20-39 that reflect societal sustainability.

City life in Oulu, Finland.
Photo: Hilda Weges / iStock

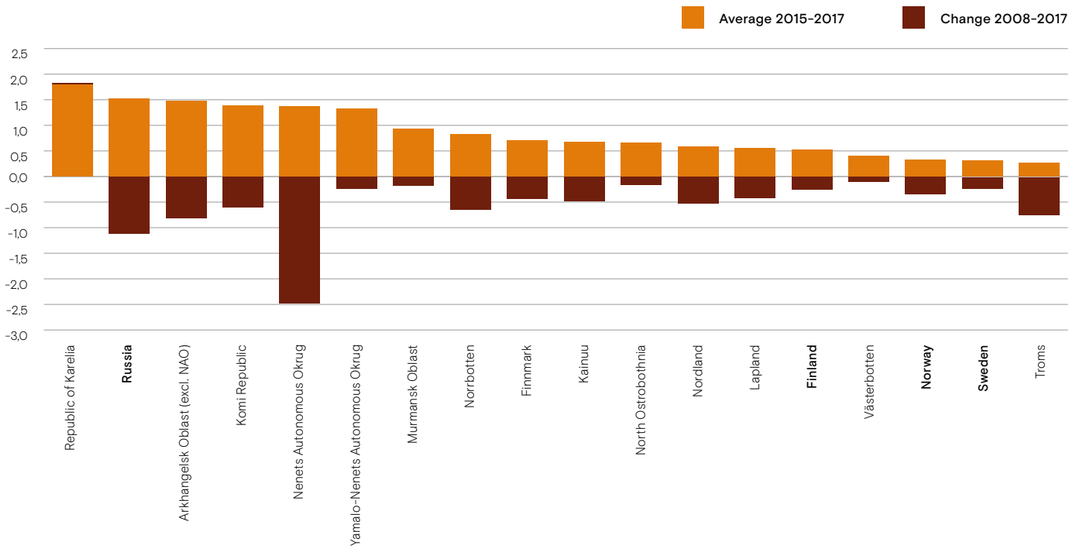
Aggregate score for indicators “Arctic Society” - the BIN regions and their countries averages



Aggregate scores are calculated for a set of indicators presented in the chapter Arctic Society. This approach assumes equal weights for the indicators. To calculate scores and compare the indicators across countries and regions we used a standard scaling formula for 1-10 point scale. Higher score means better situation in a particular region, and vice-versa.

SDG 11 — Sustainable cities and communities

Figure 2.1 — Death rates due to traffic accidents per 10,000 capita, average 2015–2017 and change 2008–2017



The results demonstrate that the death rate due to traffic accidents is much higher in the Russian BIN regions. In the Nordic BIN regions (except Troms) death rates due to traffic accidents are considerably higher than the overall average (0.38) for Sweden, Finland and Norway. For instance, the death rate in Norrbotten is 2.6 times higher than Norway's total (0.32). Since deaths due to traffic accidents are influenced by a great number of factors[1], e.g. physical (being young, inexperienced, driving under the influence of alcohol or drugs), climate and weather conditions and socio-economic factors. Crash risk factors (failure to use seatbelts, helmets and child restraints; poorly designed and maintained roads, poor visibility) and post-crash risk factors (post-crash care for injured persons to reduce fatalities and improve outcomes) all contribute to death rates due to traffic accidents. It is challenging to attribute higher death rates in the Arctic regions to any particular risk factor, hence attention should be paid to studying what particular risk factors are prevalent in the Arctic regions and for preventive measures to be designed accordingly.

[1] Bachani AM, Peden M, Gururaj G, et al. Road Traffic Injuries. In: Mock CN, Nugent R, Kobusingye O, et al., editors. Injury Prevention and Environmental Health. 3rd edition. https://www.ncbi.nlm.nih.gov/books/NBK525212/#

SDG 16 — Peace, Justice and Strong Institutions

Intentional homicide is the death of a person purposefully inflicted by another person, excluding suicides outside of a state of war. Homicide is a broader category than murder, as it also includes manslaughter.

Figure 2.2 — Intentional homicides per 100,000 capita, average 2014–2016 and change 2010–2016

The highest rates of intentional homicides are observed in the Russian BIN regions a fairly low in the Nordic BIN regions. The average value for this indicator in the Russian BIN regions was 11.7, while the average in Russia was 7.7. In the BIN Nordic regions it was 0.66, with no difference from the total for Sweden, Finland and Norway of 0.67. Research has shown that economic development, inequality and poverty are significant predictors of homicide rates across countries. Gini coefficients are used to explain intentional homicide rates as a larger income gap between poor and rich people would lead to rising criminal behaviour.

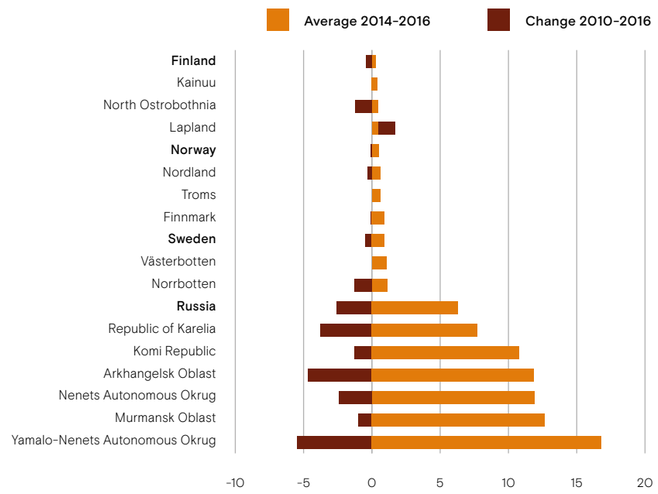


Figure 2.3 — Change in population aged 20–39 in the BIN area, %, 2009–2018

Figure 2.3 shows that all Russian BIN regions experienced negative population growth in the population group aged 20–39. With most negative changes observed in the Komi Republic and Arkhangelsk Oblast (excl. NAO). Troms region had the biggest growth, exceeding 10%, while most of the regions fell behind the corresponding country averages. In absolute numbers, the population of 20-39 year-olds decreased by 237,387 people in all BIN regions in the period from 2009 to 2018.

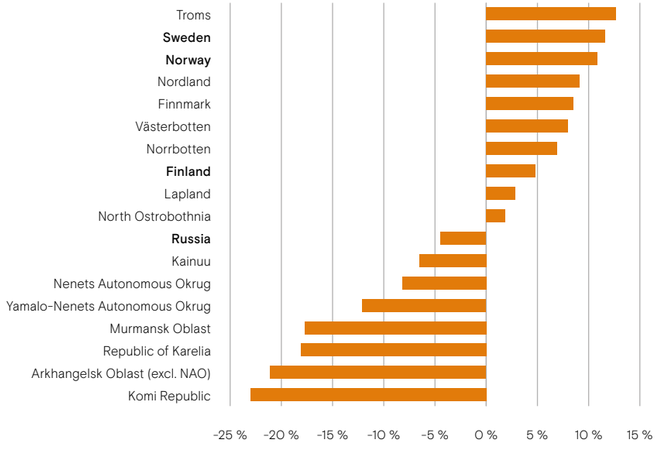
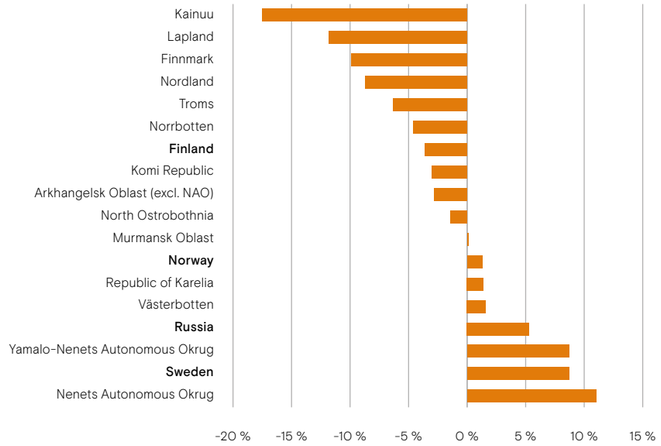


Figure 2.4 — Change in population aged 0–19 in the BIN area, %, 2009–2018

Figure 2.4 shows that only few regions had positive growth in children and youth population aged 0–19. Nenets and Yamalo-Nenets Autonomous Okrug had a growth in the range of 9–11%, while of the Nordic BIN regions only Västerbotten had a growth of 1.6%. In absolute numbers, Yamalo-Nenets Autonomous Okrug had the biggest growth, 12,268 in the group aged 0–19. Nine regions in the BIN area had negative growth ranging from -17.5% in Kainuu to (-1.45) in North Ostrobothnia. Altogether the population of 0–19 year-olds in all BIN regions decreased by 18,422 people from 2009 to 2018. Negative trends in population aged 0–19 have long-lasting effects on the societal structure in the Arctic, with fewer people needing education and entering the job market in the future. At the same time BIN area has a growing ageing population with an increase of population aged 80+ by 38,563 during 2009–2018.



Conclusions

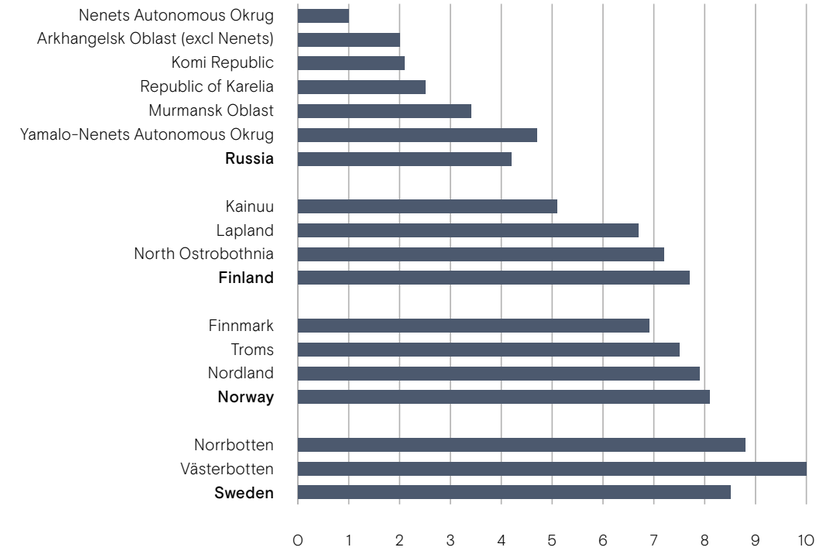
Special attention needs to be paid to safety on the roads and to deep underlying societal challenges such as availability of jobs, poverty and accessibility of mental health services that collectively explain elevated violence in the Arctic measured as homicide rates. Arctic societies are experiencing a rapid demographic shift with a decreasing population of children, and young adults and growing elderly population creating threats to sustainably functioning and resilient societies in the future.

Sustainable Economy in the Arctic

This chapter deals with energy, business activities and innovative potential and also levels of inequality at the regional level.

Yamal LNG plant
Photo: Novatek

Aggregate score for indicators “Sustainable Economy in the Arctic” - the BIN regions and their countries averages



Aggregate scores are calculated for a set of indicators presented in the chapter Sustainable Economy in the Arctic. This approach assumes equal weights for the indicators. To calculate scores and compare the indicators across countries and regions we used a standard scaling formula for 1-10 point scale. Higher score means better situation in a particular region, and vice-versa.

SDG 7 — Affordable and Clean Energy

Figure 3.1 — Balance of electricity production in TWh, 2017

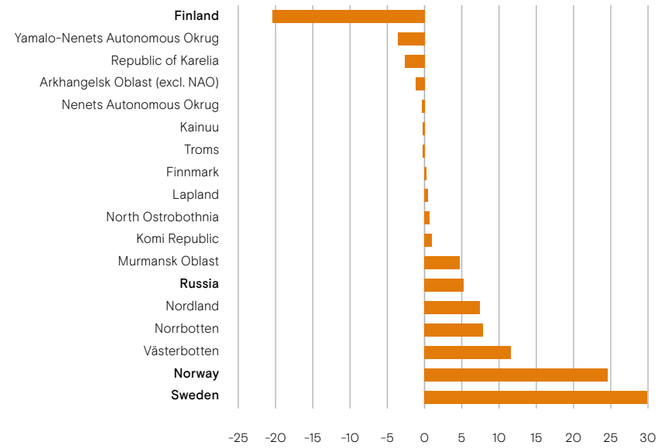


Figure 3.1 demonstrates that many High North regions in the Nordic countries have a substantial surplus of electricity produced, for instance, Västerbotten (11.6 TWh) and Norrbotten (7.8 TWh) have the greatest amount of surplus electricity produced, followed by Nordland (7.4 TWh). Of all electricity produced in the Nordic BIN regions 85% originates from renewable energy sources. (The rest from termo and nuclear production). Some Russian BIN regions have negative surplus of electricity produced, e.g. Yamalo-Nenets Autonmous Okrug and the Republic of Karelia. This abundance of electricity in the Nordic BIN regions that can potentially make them attractive for establishing energy-intensive industries, such as steel-making and battery cell production. Conversely, regions that have a deficit of electricity produced should address energy security issues and adopt strategies for installing capacity for generating green energy.

SDG 8 — Decent Work and Economic Growth

Employment rates are defined as a measure of the extent to which available labour resources (people available to work) are being used. They are calculated as the ratio of the employed to the working age population. At the EU level the target is to increase the employment rate of the population aged 20 to 64 years to at least 75% by 2020.

Figure 3.2 — Employment rates, 2018 and change 2013–2018

In 2018 average employment in the Nordic BIN regions was 65.3% of the working aged population with a slight increase of 1.3% from 2014. In 2018 average employment in the Russian BIN regions was 61.4% of working aged population with an average decrease of 5.4% from 2014. Yamalo-Nenets Autonomous Okrug had consistently highest employment rates in the range of 75% of the working age population in 2014 and 2018. Employment rates need to be studied in relation to population structure, industry structure and availability of jobs across sectors for males and females. Employment of elderly people and young people needs to be studied in more detail.

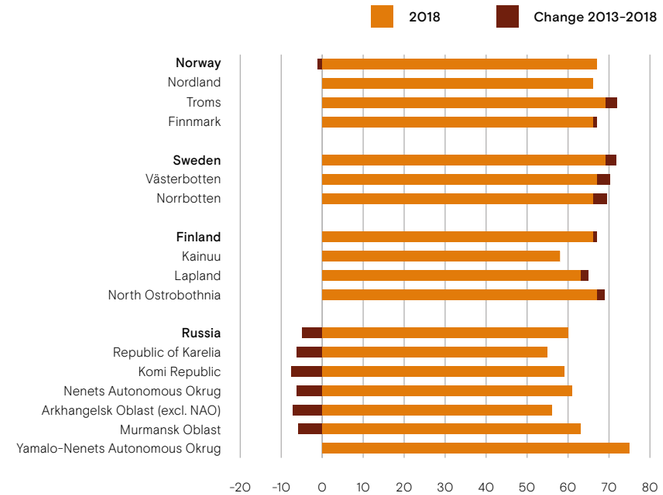
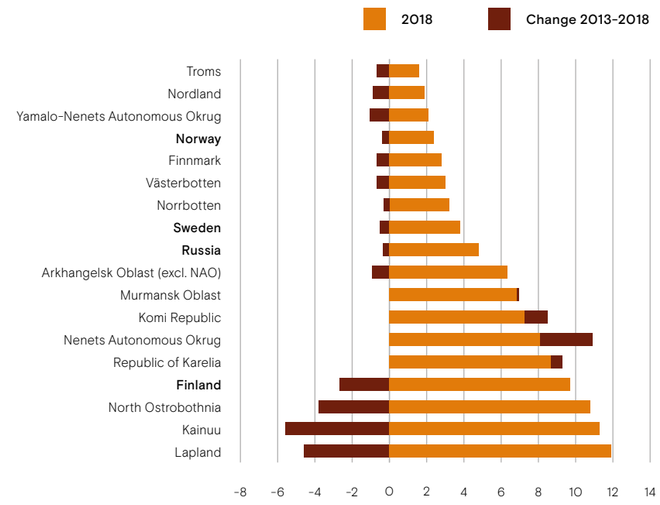
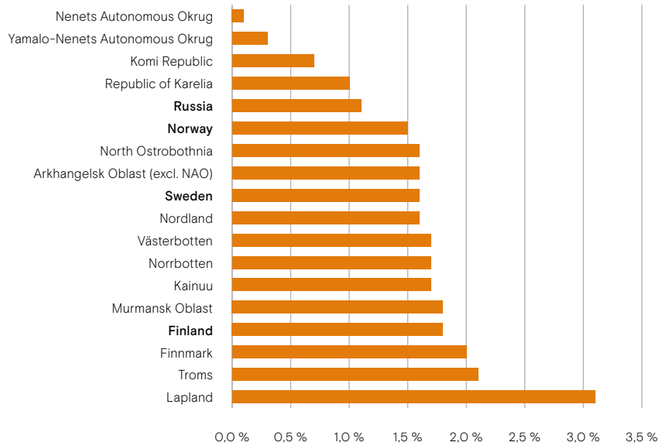


Figure 3.3 — Unemployment rate, 2018 and chnage 2013–2018



Different patterns of unemployment can be observed across the BIN regions. The highest unemployment rates are in the Finnish BIN regions averaging 11.3%. While unemployment decreased in the Finnish BIN regions in the range of 5%, it remains high. High unemployment rates in Finland are due to structural unemployment arising after the 1990s recession. Structural unemployment means that the trend for job loss is high while the employment probability trend is low[1]. In the Russian BIN regions, in 2018 unemployment was 7.4% on average with a slight increase of 0.4 percentage points over the period 2013-2015. The lowest unemployment rates are in the Norwegian BIN regions at 2.1% average. High unemployment results in a loss of income for individuals, increased pressure with respect to government spending on social benefits and a reduction in tax revenue[2]. Further investigation would require unemployment data on unemployment among young people, by sex and by proportion of people in long-term unemployment. Korona crisis severely hit labor markets in the spring of 2020, increasing unemployment to levels not seen since second world war.

Figure 3.4 — Tourism as % of regional GVA, 2017



Note: for country level as % of country GVA

Tourism is one of the largest and fastest growing sectors in the world economy and the economic achievements of tourism are significant. Tourism plays a key role in global economic activity, job creation, export revenue and domestic value added[3]. Figure 3.4 demonstrates that the regions of Lapland (3%) and Troms (2.1%) have the highest shares of tourism as % of GVA. The world median for travel and tourism direct contribution to GDP was 3.5% (World Bank). Northern regions have fairly active tourism sectors contributing to their regional GVA, however some regions. e.g. in the North of Russia would need to develop and promote tourism more in order to contribute to local job creation and the related economic development.

[1] Bank of Finland . https://www.bofbulletin.fi/en/2018/3/unemployment-rate-in-finland-close-to-structural-level/

[2] https://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics#Recent_developments

[3] OECD (2018), OECD Tourism Trends and Policies 2018, OECD Publishing, Paris, https://doi.org/10.1787/tour-2018-en

SDG 9 — Industry, Innovation and Infrastructure

Figure 3.5 — Share of households with internet broadband access (in % of total households), 2009 and 2017

Figure 3.5 shows that on average the Nordic BIN regions had 95% of households with Internet broadband access in 2017. Between 2009 and 2017 the share of households in the Nordic BIN regions with broadband access rose by 21 percentage points. In general, the Russian BIN regions had 77% of households with broadband access and the growth from 2009 to 2017 was 38%. These statistics only reflect the minimum speed of broadband access.

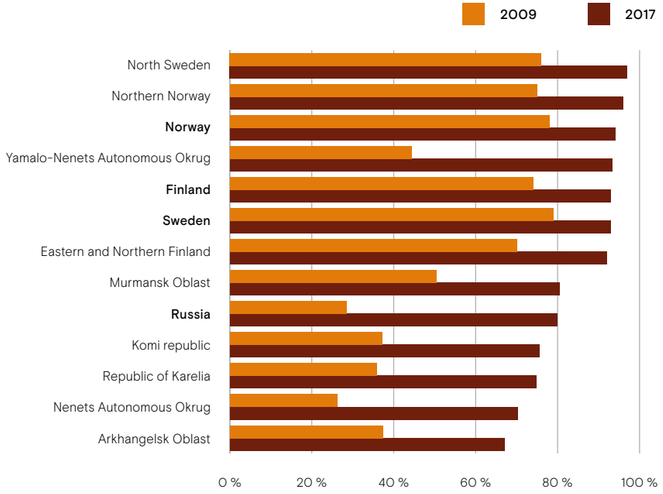


Figure 3.6 — Change in number of active enterprises, 2008–2016

Figure 3.6 demonstrates that all Nordic BIN regions saw growth in the number of active enterprises. Some regions, e.g. Västerbotten, had growth greater than the average for Sweden. All Russian BIN regions (except the Republic of Karelia) had negative growth, with the biggest decrease in Murmansk Oblast. Economic downturn and economic sanctions post-2014 influenced the decrease in the number of active enterprises in Russia in the period 2008–2016. See figure 3.7 for industry level changes.

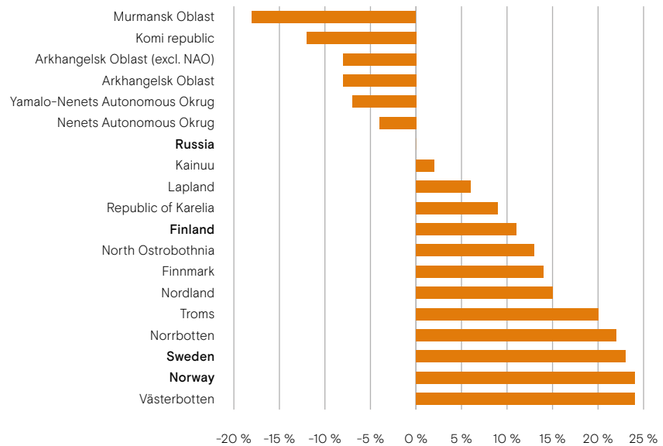


Figure 3.7 — Change in number of active enterprises by industry, 2008–2016

Manufacturing	Accomodation and food services	Construction	Manufacturing	Mining and quarrying	Wholesale and retail trade; repair of motor vehicles and motorcycles	Transport	Business activities and real estate
Finland	**13 %**	**5 %**	**-2,8 %**	**5,2 %**	**0,0 %**	**-6,3 %**	**17,9 %**
Kainuu	1 %	9 %	-16,6 %	2,3 %	0,3 %	-14,3 %	6,3 %
Lapland	10 %	0 %	-3,7 %	26,7 %	-5,1 %	-7,2 %	16,2 %
North Ostrobothnia	12 %	6 %	2,8 %	-2,8 %	-1,5 %	-3,0 %	24,7 %
Russian	**25 %**	**17 %**	**-5,8 %**	**5,6 %**	**-11,8 %**	**36,6 %**	**20,2 %**
Republic of Karelia	37 %	48 %	2,7 %	1,9 %	-3,5 %	28,8 %	29,2 %
Komi Republic	52 %	0 %	-20,9 %	-24,1 %	-11,4 %	14,0 %	7,6 %
Arkhangelsk Oblast	55 %	13 %	-17,7 %	-24,3 %	-22,9 %	3,5 %	10,6 %
Nenets Autonomous Okrug	-5 %	-22 %	18,6 %	-50,0 %	-8,7 %	18,9 %	11,4 %
Arkhangelsk Oblast (excl.NAO)	58 %	15 %	-18,4 %	-1,8 %	-23,2 %	2,9 %	10,6 %
Murmansk Oblast	23 %	-1 %	-41,9 %	-41,1 %	-33,0 %	0,1 %	12,3 %
Yamalo-Nenets Autonomous Okrug	68 %	-26 %	-41,0 %	-23,7 %	-16,6 %	41,3 %	11,2 %
Norway	**10 %**	**19 %**	**0,7 %**	**14,3 %**	**-4,4 %**	**-4,0 %**	**27,6 %**
Nordland	9 %	21 %	4,4 %	0,0 %	-13,3 %	-8,3 %	21,6 %
Troms	19 %	13 %	6,0 %	41,2 %	-15,1 %	-9,2 %	22,1 %
Finnmark	5 %	8 %	10,0 %	87,0 %	-14,0 %	-9,5 %	28,6 %
Sweden	**20 %**	**31 %**	**-0,3 %**	**2,7 %**	**6,2 %**	**0,4 %**	**37,7 %**
Västerbotten	22 %	25 %	4,7 %	0,0 %	4,7 %	0,5 %	41,6 %
Norrbotten	12 %	38 %	4,4 %	6,4 %	-2,2 %	-2,0 %	37,6 %

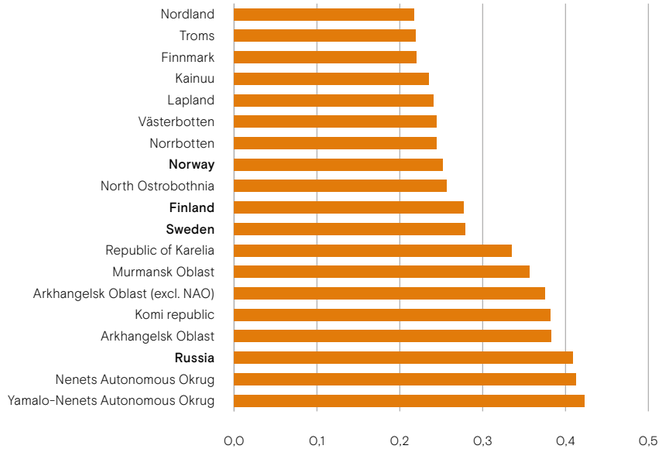
In 2018, the total number of active enterprises in the Nordic BIN regions was 142,237 and 124,885 in the Russian BIN regions. The highest growth among all regions in the Russian and Nordic BIN regions occurred in the accommodation and food sector, with 6,861 companies operating in 2006 and 8,569 in 2016. The manufacturing sector had near-zero or negative growth. The trends in mining and quarrying are not uniform across the BIN region with negative growth in the North of Russia and positive growth in Troms and Finnmark, increasing from 17 and 23 companies in 2008 to 24 and 43 companies in 2016 respectively. Since mining sector companies tend to be big, even a relatively small increase in numbers is significant for the region. Business activities and real estate demonstrated the strongest growth in the years 2008–2016, growing from 48,886 companies in 2006 to 59,220 in 2016.

SDG 10 — Reduced Inequalities

The Gini coefficient is used to measure Income inequality among individuals in the distribution of disposable income in a country or a region. The Gini coefficient is based on the comparison of cumulative proportions of the population against cumulative proportions of income they receive, and ranges between 0 in the case of perfect equality and 1 in the case of perfect inequality. A higher Gini coefficient indicates greater inequality, with high income individuals receiving much larger percentages of the total income of the population. In contrast, a lower Gini coefficient indicates a situation where income is more equally distributed among the population.

The Gini coefficient is known as an important indicator of the socio-economic development of a country. A proper just distribution of income is a prerequisite for improved quality of life, social justice and - for higher income countries – innovativeness, economic development and high labour productivity.

Figure 3.8 — Gini coefficients, 2017



The Norwegian regions of Nordland (0.217), Troms (0.219) and Finnmark (0.220) have the lowest Gini coefficients in the whole of Arctic Europe, lower than the Norway total of 0.252. In Russia, Gini coefficients are much higher with an average total of 0.409. At the same time, some regions, which are more urban, such as Karelia (0.335) and Murmansk Oblast (0.375), have lower Gini coefficients. The urban rural divide partially explains differences in Gini coefficients.[4] Nenets and Yamalo-Nenets Okrug have the highest values of Gini coefficients, these regions, dominated by the oil and gas industry, have the widest gap in the distribution of incomes between oil and gas industry workers and other sector employees. On average in the resource-extracting industry, a worker is approximately five timed better paid than an education employee[5]. The Finnish and Swedish high north regions have lower Gini coefficients than the national totals, yet higher than their neighbouring regions in the North of Norway. At-poverty risk rates (SDG2) provide additional insight into Gini coefficient interpretation.

What is a good Gini score? The top 12 countries[6] with a clear advantage in terms of both Human Development Index[7] and Global Innovation Index[8] demonstrate a range of Gini coefficients between 0.274 (Finland and Sweden) and 0.410 (USA, Israel). The average Gini for the top 12 countries is 0.327. Being placed at the top of the Human Development Index 2018, Norway was ranked nineteenth on the Global Innovation Index. In low inequality countries, there is a potential trade-off between human development and potential to innovate. However, a country's values, priorities and support mechanisms for innovation should be considered when interpreting these ratings.

[4] https://www.emerald.com/insight/content/doi/10.1108/01443580510574805/full/html

[5] Nalimov, P., & Rudenko, D. (2015). Socio-economic problems of the Yamalo-Nenets Autonomous Okrug development. Procedia Economics and Finance, 24, 543-549.

[6] Switzerland, Sweden, United States, Netherlands, United Kingdom, Finland, Denmark, Singapore, Germany, Israel, Republic of Korea, Ireland.

[7] The Human Development Index is a statistical tool used to measure a country's overall achievement in its social and economic dimensions (http://hdr.undp.org/sites/default/files/hdr_2019_overview_-_english.pdf).

[8] Global Innovation Index (https://www.globalinnovationindex.org/Home) is a composite measure of a country's entire innovation performance.

Figure 3.9 — Change in the Gini coefficients, 2012–2017

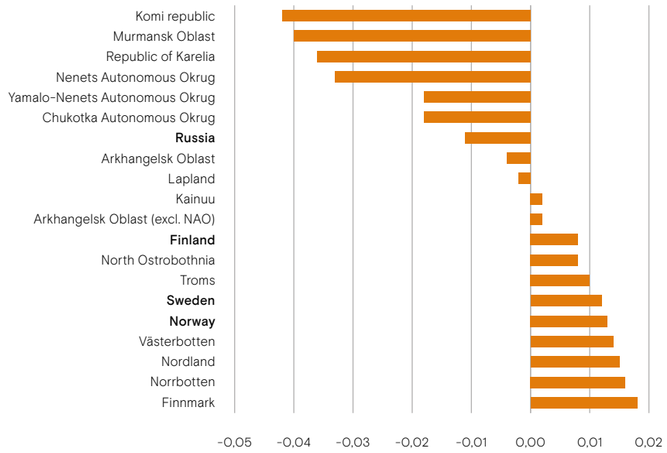
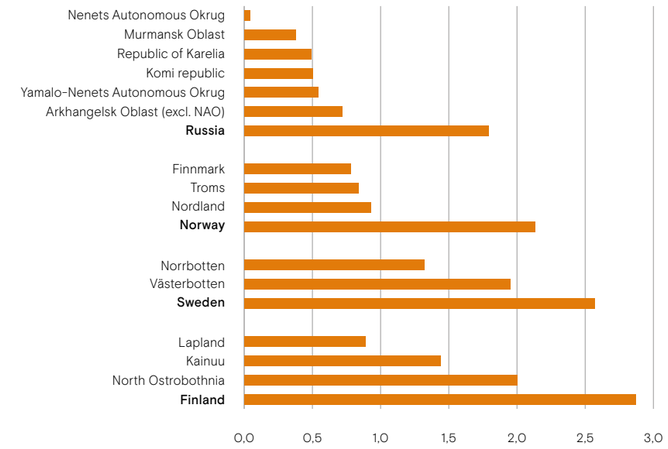


Figure 3.9 demonstrates that the Gini coefficient changes very slowly over time. However, even a small change may indicate important trends. For example, for Norway the total Gini increased by 0.02 (or by 7.7%) over the last 10 years, while for Northern Norway the increase was 11.3%. In more practical terms, this means that 10 years ago in Norway the income level of the richest 10% of the population was 2.6 times higher than the income level of the "poorest" 10% of the population. Nowadays this rate is 2.8 – an increase corresponding to a change of Gini by just 0.02 or 7.7%. For Northern Norway the change in income levels of the 10% richest compared to the 10% "poorest" was from 2.37 to 2.63 during the last 10 years. Increases in Gini were observed in most of the Nordic BIN regions, with initially the lowest level of inequality in 2012. The biggest decrease was observed in the North of Russia with initially the highest level of inequality. The Finnish BIN regions did not have big changes in Gini coefficients. The Nordic trend should not be considered to be necessarily negative while the Russian trend is positive, the best performing countries in human development and innovations had Gini coefficients in the range 0.274-0.410.

Figure 3.10 — Number of patent applications per 10,000 capita



Note: Patent applications sent to national patent offices. Russian data average for 2013–2018. Nordic countries data average for 2008–2017.

Figure 3.10 shows the average number of patent applications per 10,000 capita submitted to national intellectual property rights authorities. Patenting is an important indicator of innovative activity towards the commercialization of new knowledge. On a national basis, Finland has the highest level of patenting activity followed by Sweden, Norway, and Russia. Among the BIN regions, North Ostrobothnia and Västerbotten demonstrate the highest level of patenting activity. Since the statistics shown are based on the applicant's (owner of the invention) address, a large number of inventions made in the regions of Norrbotten and North Ostrobothnia by local inventors are included in the total numbers for Sweden and Finland (as such the inventions are owned respectively by Eriksson and Nokia). Besides Norrbotten, Västerbotten, North Ostrobothnia, the other BIN regions demonstrate rather low levels of patenting activity (less than half of their respective national averages). This indicates a lack of larger companies doing R&D and also a lack of knowledge infrastructure. This limits the integration of the regions in the knowledge-based economy. Knowledge-based economy sustains growth through technological advantage, access to information and know-how; to a lesser extent it depends on natural resources and physical means of production located in the region.

Conclusions

The Nordic Arctic regions had a total of 29.3 TWh electricity surplus in 2017. There is a need for efficient local use of electricity produced predominantly from renewable sources. Hence, the Nordic Arctic region has a potential to become attractive for establishing energy-intensive industries.

Business activity measured in terms of stock in active enterprises shows that business activities are thriving in the sector of business activities and real estate and in the hospitality sector, while the number of manufacturing firms is in decline.

The employment rate needs to be increased in most of the regions apart from Yamalo-Nenets Autonomous Okrug. The unemployment situation is very different across countries with challenges persisting in Finland and Russia. The scale of inequality is very different between the Nordic and Russian regions.

Creation of new jobs, increasing innovative potential and fostering knowledge economy should be on the development agenda of the Arctic regions.

The Arctic Environment

This chapter deals with SDG 13 Climate Action. Specifically, we address CO_2 emissions resulting from human activity.

SDG 13 — Climate Action

Hammerfest Island Melkøya , gas processing plant.
Photo: iStock

Figure 4.1 — Emissions of kg CO_2 equivalent, per capita, 2017

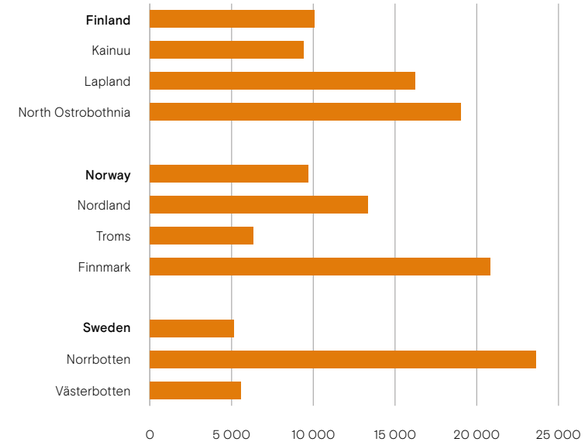


Figure 4.1 shows emissions of kg CO_2 equivalent per capita in the BIN Nordic regions. Industry accounts on average for 75 % of all CO_2 emissions. High emissions per capita in e.g. Norrbotten and North Ostrobothnia are explained by energy-intensive industries (steel-making, which also uses coal and coke in the process) and relatively low population density. For instance, 90 % of the EU's iron ore extraction takes place in the Norrbotten region, while only 2.4 % of Sweden's population live there[1]. The population density is very low in Norrbotten with just 2.6 people per square km, while in the whole of Sweden it is 25.1. The table below exemplifies the share of the Artic regions in the country's total emissions. The industrialized regions have higher emissions than the regions with no manufacturing and industrial production sectors.

Share of the Arctic regions in the country's total emissions					
Norway	100%	Sweden	100%	Finland	100%
Finnmark	3.0%	Norrbotten	11.4%	Lapland	14.2%
Troms	2.0%	Västerbotten	2.9%	Kainuu	1.5%
Nordland	6.2%			North Ostrobothnia	5.3%

Note: Data for Finland without land use and land-use change and forestry.

[1] Climate and energy strategy for the county of Norrbotten

Figure 4.2 — Change in emissions of kg CO_2 equivalent per capita, %, 2013–2017

Figure 4.2 demonstrates that on the country level Sweden, Norway and Finland reduced their emissions of kg CO_2 equivalent. In the regions with increased industrial activity, e.g. Nordland, Norrbotten, emissions grew in the period 2013-2017.

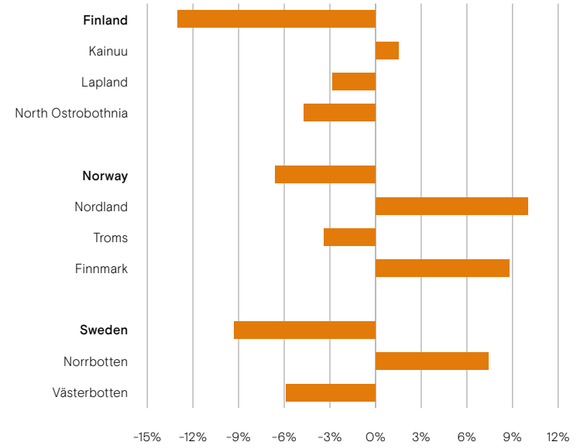
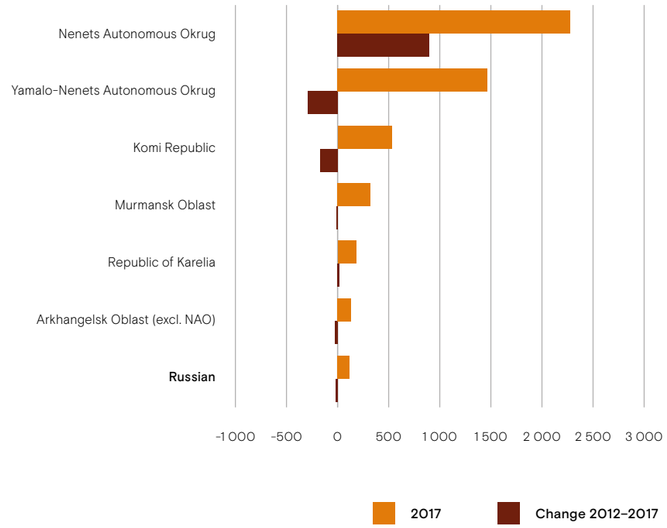


Figure 4.3 — Pollutants emitted into the atmosphere from stationary sources, kg per capita, Russia

For the Russian BIN regions we use the indicator "pollutants emitted into the atmosphere from stationary sources" since no comparable data on CO_2 emissions are available. For Russia in general, about half of the pollutants into the atmosphere are released from stationary sources. The pollutants include solids, gaseous and liquid substances: sulphur dioxide (SO_2), nitrogen oxides (NO_2), carbon monoxide (CO), hydrocarbons (without volatile organic compounds), volatile organic connections, other gaseous and liquid substances. The Yamalo-Nenets and Nenets Autonomous Okrug have the highest values among the indicators. all due to the hydrocarbon projects in the area. Yamalo-Nenets demonstrated the highest decrease of pollutants, while Nenets demonstrated the highest increase from 2012 to 2017.



Conclusions

The Arctic regions are feeling the results of climate change with diminishing ice, permafrost melting, erosion and other negative consequences. Analysis of indicators of SDG13 Climate Change should be collaged with the demographic and societal changes in the region. Economic activity conducive to increased emissions should be viewed together with wellbeing in the region. It is important to have regionally specific strategies and plans for climate change mitigation that take into consideration all aspects of sustainable development.

Arctic Partnerships

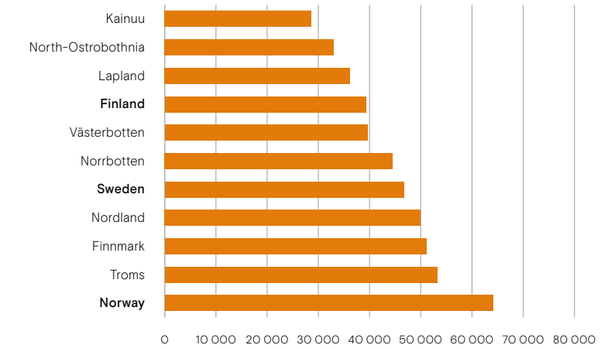
In this chapter, indicators from the Macroeconomic Dashboard are analysed. These indicators are used to measure the achievement of the goal to enhance global macroeconomic stability, including thorough policy coordination and policy coherence. The Macroeconomic Dashboard features a set of indicators that have agreed international standards indicative of macroeconomic stability and growth in sustainability. The indicator selection builds on existing macroeconomic monitoring frameworks followed by countries and by international and regional agencies. A successful sustainable development agenda requires partnerships between governments, the private sector and civil society.

SDG 17 — Partnership for the Goals

Tromsø bridge lighted by colours of the UN 17 sustainable development goals, August 2019
Photo: Ørjan Aslaksen/Scream Media for Norad

Gross domestic product (GDP) is the standard measure of the value added created through the production of goods and services in a country during a certain period. It also measures the income earned from that production or the total amount spent on final goods and services (less imports).

Figure 5.1 — GDP, Euro per inhabitant, 2016



Gross Domestic Product (GDP) per capita is often used as an estimate of the material prosperity of a country and well-being too. Figure 38 shows that GDP per capita (price adjusted) is highest in Norway and its Arctic regions Troms, Finnmark and Nordland. A trong economy coupled with a small population living in the north translates into high values of GDP per capita in Norway. The lowest level of GDP per capita is observed in Kainuu and North Ostrobothnia. The difference on the regional level between the richest regions and those with lowest GDP per capita are twofold. We observe that the Arctic regions follow the levels of GDP per capita on the country level. Differences between the metropolitan and the Northern regions are pronounced in all countries.

Figure 5.2 — GDP (GRP), Euro per inhabitant, 2017, Russia

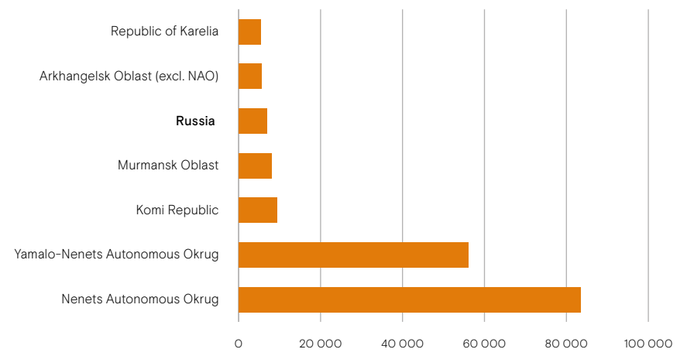


Figure 5.2 shows GDP (measured as Gross Regional Product) per inhabitant in 2017. The highest GDP per capita is in Yamalo-Nenets and Nenets Autonomous Districts, both heavily involved in the exploitation and export of hydrocarbon natural resources. The Russian economy still depends heavily on natural resources and differences between GRP across regions are significant. This may set limits to the development of partnerships towards decreased cross-regional inequality and increased innovations. A worrying trend is the marked inequality of disposable income in "rich" regions (as shown in the chapter Economy, both Yamal and Nenets have the highest Gini scores, above 0.41).

Figure 5.3 — GDP growth, average annual growth 2008-2016

Figure 5.3 illustrates annual average GDP growth 2008-2016. The highest growth occurred in Finnmark, Troms and Nordland, where the economy is driven by extractive industries, manufacturing, aquaculture and construction. In Finland and Sweden growth on the regional level was below the country average, except for Lapland, which is much affected by the tourism industry. Slow growth in Finland can be linked to the consequences of the post-2008 recession and shrinking exports to Russia. High growth in the Arctic regions in Norway presents some challenges to sustainable development due to the growth in consumption and associated environmental burden.

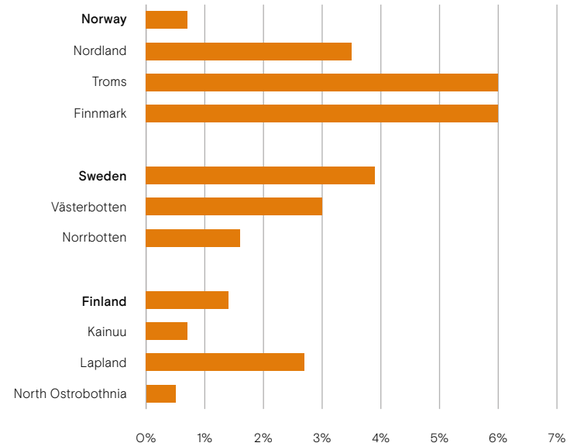
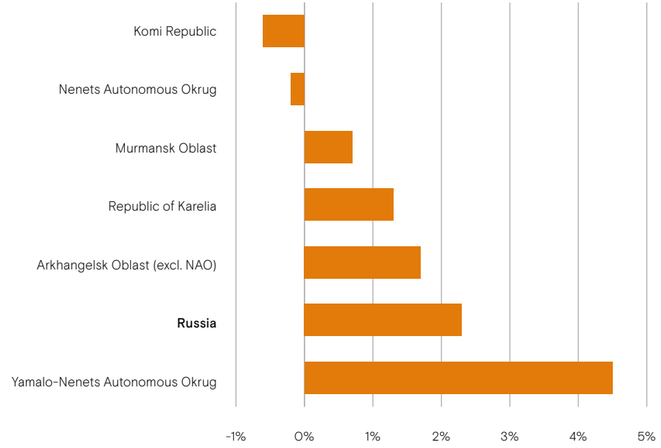


Figure 5.4 — GDP (GRP), average annual growth, 2009–2017, Russia

Figure 5.4 shows the annual growth of GDP (measured as Gross Regional Product) 2009-2017. There is rather big difference in growth rates ranging from -0.6% in Komi Republic to +4.5% in Yamalo-Nenets Autonomous Okrug. LNG and oil exports and the construction sector are the main drivers of the economy of Yamalo-Nenets. Arkhangelsk oblast has a strong manufacturing industry. Major industries of Karelia are manufacturing, transport and mining and these demonstrated unstable economic growth. Murmansk relies on mining, manufacturing, fisheries and aquaculture. Oil and gas are the major industries in Nenets and Komi. The development of these regions is limited by their remoteness and relative lack of transport infrastructure. Growth in Russia overall is conditioned by the largest industries, namely manufacturing, mining and extraction of natural resources, trade, transportation and storage. We can see that the Russian regions are very different in terms of industrial profile, infrastructure and distances to major transport infrastructure.



Conclusions

Macroeconomic indicators help to understand the level of economic development and associated prosperity for the population. The Arctic regions have very diverse profiles. Regions with a high share of extractive industries, for example, demonstrate very high growth and GDP per capita. Economic development and high GDP per capita are linked to overconsumption. Some of the richest Arctic regions, on the other hand, have the highest level of inequality and the worst poverty rates. Achieving partnerships through macroeconomic stability needs to be done in conjunction with improved human development, increased sustainable consumption and increased environmental sustainability. Stronger partnerships should be developed from national government systems, in order to strengthen sustainability in the Arctic areas, since many weaknesses can be mitigated through national initiative and renewed policies for the Arctic accounting better for people and businesses present here.

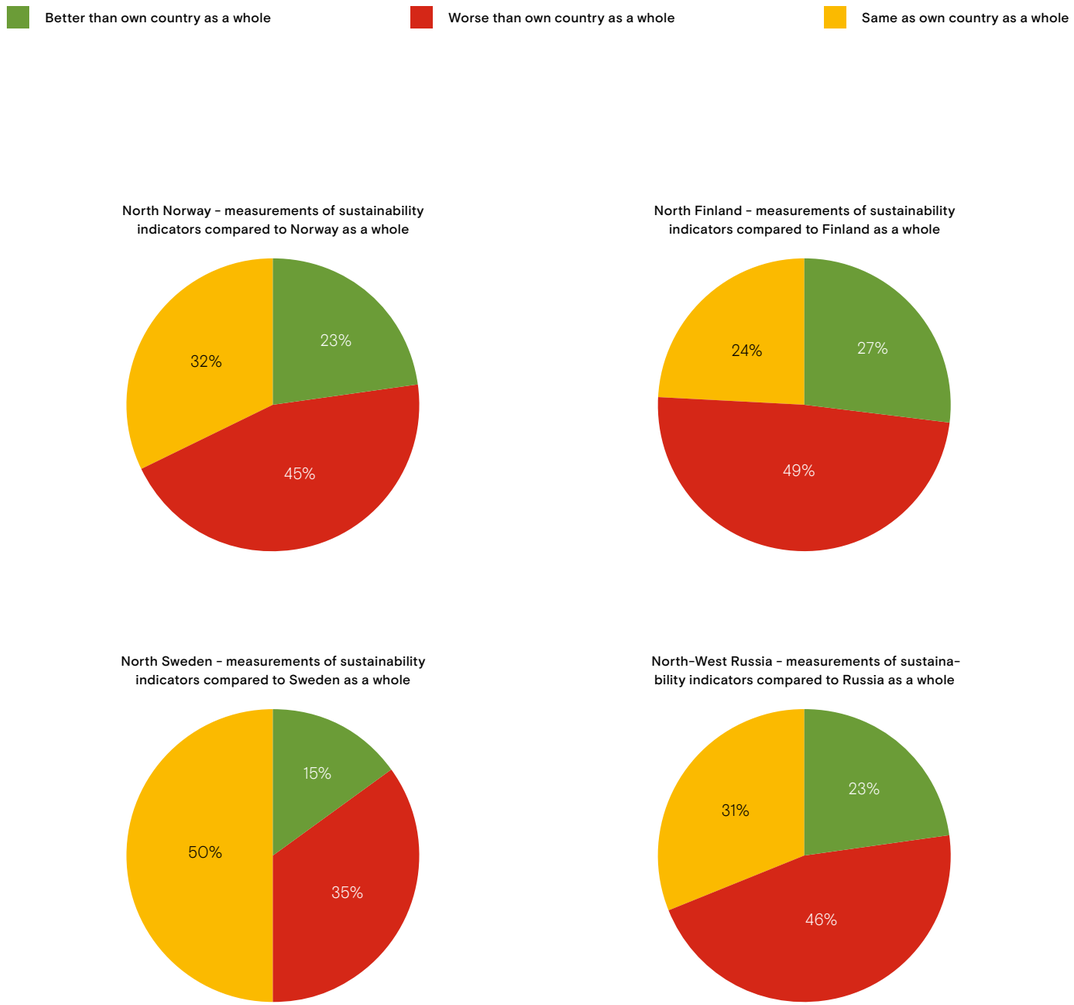
Summary tables

The four tables presented in this section compare the sustainable development indicators of the Northern regions of Norway, Sweden, Finland and Russia each to the overall situation in their own respective countries.

For example, the regions of Northern Norway are compared to the overall situation in Norway, the regions of Northern Finland are compared to the overall situation in Finland, etc. The tables do not assess the overall level of sustainable development for the countries on an international scale. Rather, the tables describe differences within the countries, on a national scale. And these differences, between the north and the rest, are big for all four countries. In general, with the exceptions of the regions of North Ostrobothnia in Finland, and Yamalo-Nenets in Russia, the Arctic areas lag behind their respective countries in terms of sustainable development. Prior to presenting the four tables, we would like to illustrate the percentages of sustainability measurements for northern areas of each country compared that region's country as a whole. In general, in only 21% of the measurement cases, do the Northern areas of the four countries outperform their respective countries as a whole, in 34% of the indicators the situation is approximately the same and about 45% of the indicators describe a situation worse than that prevailing in the country as a whole.

The indicators for each region are shown in the four tables presented next. We use three colours to indicate development status – green if the situation in the region is better than in that region's country as a whole, yellow if this is approximately at the same level, and red if the situation is worse. At the same time, where it is possible, we indicate development trends for the indicators. Arrows pointing upward indicate an increase in recent years, arrows pointing downward indicate decrease. Arrows pointing to the right, in turn, indicate stability or stagnation[1].

Figure 6.1 — Measurements of sustainability indicators for northern regions compared to their countries as a whole



[1] Please note that the terms increase, decrease, stability (associated with the arrows) have numerical but not public value related references.

Figure 6.2 — Sustainability indicators for regions in Northern Norway compared to the situation in Norway as a whole

Better than Norway as a whole

Worse than Norway as a whole

Same as Norway as a whole

Increasing ↑

Stable →

Decreasing ↓

Pillar	Indicator	Nordland	Troms	Finnmark
People	1.2.1 At-risk-of-poverty rate, 2017	→	→	↑
	2.4.3 Arable land in sq. km per 1000 people	↓	↓	↓
	2.4.4 Level of crops production per capita, 2018	↓	↑	→
	2.4.5 Level of milk production per capita. 2018	↓	↓	↑
	2.4.6 Level of cattle production per capita, 2018	↓	↓	↑
	3.8.5 Total death rate due to ischemic heart disease, cancer, chronic respiratory diseases and suicides, average rate for 2015-2017	↓	↓	→
	3.8.6 Life Expectancy at birth for males (years) in 2017			
	3.8.7 Life Expectancy at birth for females (years) in 2017			
	4.3.1 Population 25 – 64 aged with tertiary education (%)	↓	↓	↓
	5.5.1 Employment participation rate as % of labour force aged 15-64, by sex - Females, 2017	↑	→	→
	5.5.1 Employment participation rate as % of labour force aged 15-64, by sex-Males, 2017	→	→	↑
	BIN inferred indicator: Total population growth, 2009-2018, %			
Society	11.2.1 Death rate due to traffic accidents per 10 000 population, average 2015-2017	→	→	→
	16.1.1 Intentional homicide rate (homicides per 100 000 population)	→	→	↑
	BIN inferred indicator: Growth in share of young people (0-19 years), 2009-2018, %			
	BIN inferred indicator: Growth in share of young adults (20-39 years), 2009-2018, %			
Economy	7.1.1 Surplus of electricity production in TWh per 100 000 capita, 2017			
	8.5.1 Employment rate as % of working population, 2018	→	↑	→
	8.5.2 Unemployment rate (% total labor force), 2018	→	→	→
	8.9.1 Tourism as % of Regional GVA, 2017			
	9.b.1 Growth in number of active enterprises, 2008-2017, %			
	10.2.1 Gini coefficient, 2017	→	→	→
Environment	13.2.1 CO_2 equivalent emissions per capita, 2017	↑	↓	↑
Partnership	17.12.1.1 GDP annual growth, %, 2009-2016			
	17.12.1.2 GDP, Euro per inhabitant, 2018			
	9.1.1 Share of households with Internet broadband access in % of total households, 2017 (same for target 9.c)	↑	↑	↑

Figure 6.3 — Sustainability indicators for regions in Northern Sweden compared to the situation in Sweden as a whole

Better than Sweden as a whole

Worse than Sweden as a whole

Same as Sweden as a whole

Increasing ↑

Stable →

Decreasing ↓

Pillar	Indicator	Västerbotten	Norrbotten
People	1.2.1 At-risk-of-poverty rate, 2017	↑	↑
	2.4.3 Arable land in sq. km per 1 000 people	↓	↓
	2.4.4 Level of crops production per capita, 2018	↓	↓
	2.4.5 Level of milk production per capita. 2018	↓	↓
	2.4.6 Level of cattle production per capita, 2018	↓	↓
	3.8.5 Total death rate due to ischemic heart disease, cancer, chronic respiratory diseases and suicides, average rate for 2015-2017	↓	↓
	3.8.6 Life Expectancy at birth for males (years) in 2017		
	3.8.7 Life Expectancy at birth for females (years) in 2017		
	4.3.1 Population 25 – 64 aged with tertiary education (%)	↑	↑
	5.5.1 Employment participation rate as % of labour force aged 15-64, by sex - Females, 2017	↑	↑
	5.5.1 Employment participation rate as % of labour force aged 15-64, by sex-Males, 2017	↑	→
	BIN inferred indicator: Total population growth, 2009-2018, %		
Society	11.2.1 Death rate due to traffic accidents per 10 000 population, average 2015-2017	→	→
	16.1.1 Intentional homicide rate (homicides per 100 000 population)		
	BIN inferred indicator: Growth in share of young people (0-19 years), 2009-2018, %		
	BIN inferred indicator: Growth in share of young adults (20-39 years), 2009-2018, %		
Economy	7.1.1 Surplus of electricity production in TWh per 100 000 capita, 2017		
	8.5.1 Employment rate as % of working population, 2018	↑	↑
	8.5.2 Unemployment rate (% total labor force), 2018	→	→
	8.9.1 Tourism as % of Regional GVA, 2017		
	9.b.1 Growth in number of active enterprises, 2008-2017, %		
	10.2.1 Gini coefficient, 2017	→	→
Environment	13.2.1 CO_2 equivalent emissions per capita, 2017	↓	↑
Partnership	17.12.1.1 GDP annual growth, %, 2009-2016		
	17.12.1.2 GDP, Euro per inhabitant, 2018		
	9.1.1 Share of households with Internet broadband access in % of total households, 2017 (same for target 9.c)	↑	↑

Figure 6.4 — Sustainability indicators for regions in Northern Finland compared to the situation in Finland as a whole

Better than Finland as a whole

Worse than Finland as a whole

Same as Finland as a whole

Increasing ↑

Stable →

Decreasing ↓

Pillar	Indicator	Kainuu	Lapland	North-Ostrobothnia
People	1.2.1 At-risk-of-poverty rate, 2017	→	→	→
	2.4.3 Arable land in sq. km per 1000 people	↓	↓	↓
	2.4.4 Level of crops production per capita, 2018	↑	↑	↓
	2.4.5 Level of milk production per capita. 2018	↑	↑	↑
	2.4.6 Level of cattle production per capita, 2018	↑	↑	↑
	3.8.5 Total death rate due to ischemic heart disease, cancer, chronic respiratory diseases and suicides, average rate for 2015-2017	→	→	→
	3.8.6 Life Expectancy at birth for males (years) in 2017			
	3.8.7 Life Expectancy at birth for females (years) in 2017			
	4.3.1 Population 25 – 64 aged with tertiary education (%)	↑	↑	↑
	BIN inferred indicator: Total population growth, 2009-2018, %			
Society	11.2.1 Death rate due to traffic accidents per 10 000 population, average 2015-2017	→	→	→
	16.1.1 Intentional homicide rate (homicides per 100 000 population)	→	→	↓
	BIN inferred indicator: Growth in share of young people (0-19 years), 2009-2018, %			
	BIN inferred indicator: Growth in share of young adults (20-39 years), 2009-2018, %			
Economy	7.1.1 Surplus of electricity production in TWh per 100 000 capita, 2017			
	8.5.1 Employment rate as % of working population, 2018	→	↑	↑
	8.5.2 Unemployment rate (% total labor force), 2018	↓	↓	↓
	8.9.1 Tourism as % of Regional GVA, 2017			
	9.b.1 Growth in number of active enterprises, 2008-2017, %			
	10.2.1 Gini coefficient, 2017	→	→	→
Environment	13.2.1 CO_2 equivalent emissions per capita, 2017	→	↓	↓
Partnership	17.12.1.1 GDP annual growth, %, 2009-2016			
	17.12.1.2 GDP, Euro per inhabitant, 2018			
	9.1.1 Share of households with Internet broadband access in % of total households, 2017 (same for target 9.c)	↑	↑	↑

Figure 6.5 — Sustainability indicators for regions in North-West Russia compared to the situation in Russia as a whole

Better than Russia as a whole

Worse than Russia as a whole

Same as Russia as a whole

Increasing ↑

Stable →

Decreasing ↓

Pillar	Indicator	Karelia	Komi	Nenets	Arkhangelsk Oblast	Murmansk Oblast	Yamalo-Nenets
People	1.2.1 At-risk-of-poverty rate, 2017	↓	↓	↑	→	↓	→
	2.4.3 Arable land in sq. km per 1000 people	→	→	→	→	↓	→
	2.4.4 Level of crops production per capita, 2018	↓	↓	↓	↓	↓	→
	2.4.5 Level of milk production per capita. 2018	↓	→	→	↑	↓	→
	2.4.6 Level of cattle production per capita, 2018	↓	→	→	↑	↓	→
	3.8.5 Total death rate due to ischemic heart disease, cancer, chronic respiratory diseases and suicides, average rate for 2015-2017	↓	↓	↓	↓	↓	→
	3.8.6 Life Expectancy at birth for males (years) in 2017	↑	↑	↑	↑	↑	↑
	3.8.7 Life Expectancy at birth for females (years) in 2017	↑	↑	↑	↑	↑	↑
	4.3.1 Population 25 – 64 aged with tertiary education (%)						
	5.5.1 Employment participation rate as % of labour force aged 15-64, by sex - Females, 2017	↑	↓	→	→	→	→
	5.5.1 Employment participation rate as % of labour force aged 15-64, by sex-Males, 2017	→	↓	↓	→	↑	→
	BIN inferred indicator: Total population growth, 2009-2018, %						
Society	11.2.1 Death rate due to traffic accidents per 10 000 population, average 2015-2017	→	→	→	→	→	→
	16.1.1 Intentional homicide rate (homicides per 100 000 population)	↓	↓	↓	↓	↓	↓
	BIN inferred indicator: Growth in share of young people (0-19 years), 2009-2018, %						
	BIN inferred indicator: Growth in share of young adults (20-39 years), 2009-2018, %						
Economy	7.1.1 Surplus of electricity production in TWh per 100 000 capita, 2017						
	8.5.1 Employment rate as % of working population, 2018	↓	↓	↓	↓	↓	→
	8.5.2 Unemployment rate (% total labor force), 2018	→	↑	↑	→	→	↓
	8.9.1 Tourism as % of Regional GVA, 2017						
	9.b.1 Growth in number of active enterprises, 2008-2017, %						
	10.2.1 Gini coefficient, 2017	↓	↓	↓	→	↓	→
Environment	13.2.1 CO_2 equivalent emissions per capita, 2017	↓	↓	↑	↓	↓	↓
Partnership	17.12.1.1 GDP annual growth, %, 2009-2016						
	17.12.1.2 GDP, Euro per inhabitant, 2018						
	9.1.1 Share of households with Internet broadband access in % of total households, 2017 (same for target 9.c)	↑	↑	↑	↑	↑	↑

Appendix

The five pillars approach: SDGs, targets and indicators used

There are many ways to group SDGs, the most common being to group all 17 SDGs into either three (Economy, Society and Environment) or five blocks (People, Planet, Prosperity, Peace and Partnership). These both types of wording and grouping originate from the UN. According to The UN Foundation, SDGs are a framework of interconnected goals and progress on one block of goals must be reflected and supported in another. In this report we propose a modified approach of grouping of SDGs into five pillars that use labels and constructs that are more obvious for describing corresponding phenomena. The proposed grouping builds on the UN's three-block and five-block approaches. Our proposed five pillars are thus: People, Society, Economy, Environment and Partnership.

We select targets and indicators based on their appropriateness to represent development towards SDGs in the Arctic. For example, ***Target 1.1: Eradicate extreme poverty.*** According to UN definition this should be measured by an indicator of extreme poverty eradication, or by 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.90 a day. As shown, this target and indicator are not appropriate for developed societies. Hence, we chose, Target 1.2: Reduce poverty by at least 50%.

An appropriate suitable indicator, by 2030, is to reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions, which would be ***at risk of being in the poverty rate***.

This list contains SDGs grouped by pillars, targets and indicators. Some indicators are not the same as those provided in the UN list, this is due to localization of SDGs for the Arctic region. Hence some of the indicators are selected based on customization, relevance and data availability criteria. The availability of comparable data on the regional level appeared as a sound issue. However, we believe this is the most comprehensive view on SDGs achievement and progress in the Arctic area based on the five-pillar approach.

Pillar	SDG	Target/s	Indicator/s
People	SDG1 No Poverty	**1.2** By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions **1.B** Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.2.1 At-risk-of-poverty rate
	SDG2 Zero Hunger	**2.4** By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather conditions, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1 Agricultural land in use 2.4.2 Arable land in use 2.4.3 Arable land in sq. km per 1000 people 2.4.4 Change in production of crops, milk and cattle, %
	SDG3 Good Health and Well-being	**3.8** Achieve universal health-care coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.	3.8.1 Death rate due to ischaemic heart disease per 10,000 population 3.8.2 Death rate due to cancer per 10,000 population 3.8.3 Death rate due to chronic respiratory diseases per 10 000 population 3.8.4 Death rate due to suicides per 10,000 population 3.8.5 Total death rate due to ischaemic heart disease, cancer, chronic respiratory diseases and suicides 3.8.6 Life Expectancy at birth (years) in 2017
	SDG4 Quality Education	**4.3** By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	4.3.1 Population 25 – 64 aged with tertiary education (%)
	SDG5 Gender Equality	**5.4** Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate **5.5** Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	5.4.1 Employment gap, by sex 5.5.1 Employment participation rate as % of labour force aged 15-64, by sex,
	Demographic security	Recognize and prevent depopulation of the Arctic territories. This indicator is inferred by the BIN project (it is not included in the UN framework) although it is very important for the Arctic areas, which are sparsely populated and characterized by small communities spread over large land areas.	Change in total population (trend for the last 10 years), %
Society	SDG 11 Sustainable cities and communities	**1.2** By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, people with disabilities and older persons **11.3** By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.2.1 Death rate due to traffic accidents per 10,000 population 11.3.1 Death rate due to traffic accidents per 10 000 population
	SDG 16 Peace, Justice and Strong Institutions	**16.1** Significantly reduce all forms of violence and related death rates everywhere	16.1.1 Intentional homicide rate (homicides per 100,000 population)
	Societal integrity	Ensure favourable structure of Arctic societies, stimulating human development, exchange of knowledge, good quality of life, as well as economic sustainability. This indicator is inferred by the BIN project (it is not speicifcally included in the UN framework) although it is very important for the Arctic areas, which are sparsely populated and characterized by small communities spread over large land areas.	Change in share of young people 0-19 years old (trend for the last 10 years), % Change in share of young adults 20-39 years old (trend for the last 10 years), %
Economy	SDG 7 Affordable Clean Energy	**7.1** By 2030 ensure universal access to affordable, reliable and modern energy services	7.1.1 Electricity production from wind and hydropower in TWh and as % of energy mix
	SDG8 Decent Work and Economic Growth	**8.5** By 2030, achieve full and productive employment and decent work for all women and men, including for young people and people with disabilities, and equal pay for work of equal value **8.9** By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	8.5.1 Employment rate as % of working population 8.5.2 Unemployment rate (% total labour force) 8.9.1 Tourism as % of GVA
	SDG9 Industry, Innovation and Infrastructure	**9.1** Develop high-quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all **9.b** Support domestic technology development, research and innovation in developing countries, including by ensuring a policy environment conducive, inter alia, to industrial diversification and value addition to commodities **9.c.** Significantly increase access to information and communication technology and strive to provide universal and affordable access to the Internet in the least developed countries by 2020	9.1.1 Share of households with Internet broadband access in % of total households, in 2009 and 2017 (same for target 9.c). In the summary tables indicator 9.1.1. is included in the pillar partnerships. Digital connectivity is important for both economic development and for partnerships as it enables communication, exchange of information, mutual understanding and coordination of activities. 9.b.1 Number of active enterprises Number of patent applications per 10,000 of population

Pillar	SDG	Target/s	Indicator/s
Economy, conts	SDG 10 Reduced Inequalities	**10.2** By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	10.2.1 Gini coefficient
Environment	SDG 13 Climate Action	13.2 Integrate climate change measures into national policies, strategies and planning	13.2.1 CO_2 equivalent emissions per capita
Partnership	SDG 17 Partnership	17.13 Enhance global macroeconomic stability, including thorough policy coordination and policy coherence	17.12.1 Selected indicators from Macroeconomic dashboard

Comparing SDG indicators for the Northern regions to those of their respective countries as a whole

We use three colours to indicate development status – green if the situation in the region is better than country as a whole, yellow if this is approximately the same level, and red if the situation is worse. We used +/- 10% interval to compare development status in the region to the country as a whole. If the value of the indicator in the region differs by more than 10% either way from the region's country as a whole, the difference is considered and assigned either a green or a red marker. For example, the at-risk-of-poverty rate in Troms is 8.1, while for Norway as a whole it is 10. That is -19% difference, and since less poverty is better, Troms gets a green marker for this indicator – the situation is better than in Norway as a whole. If the difference is less than 10%, we consider that the situation in the region is approximately the same and assign a yellow marker.

At the same time, where possible, we indicate the development trend for the indicators. Arrows pointing upward indicate an increase in recent years, arrows pointing downwards indicate a decrease. Arrows pointing to the right, in turn, indicate stability or stagnation. Please note that the terms increase, decrease, stability (associated with the arrows) have numerical but not public value related references. For example, an arrow pointing down does not necessarily mean that the situation is getting worse. Instead, it just shows that the numerical value of the indicator has decreased in recent years. This may be good for indicators like death rate, but bad for indicators like arable land in use if we interpret them in terms of public value. Such interpretations are left to the readers of this report. This mode of comparison includes all five pillars but shows in-country differences between the Northern areas and rest of the respective countries. An integrated dataset with core values for each region and indicator can be made available to readers of this report upon request.

Comparing SDG indicators for Northern regions across countries

We use a 10-point scale to compare the indicators across countries. Values for countries' averages are also included in the comparisons. For each indicator, the region or country with the best value is given a score of 10 and the region or country with the worst value is given a score of 1. Then all the other regions and countries are assigned scores between 1 (the worst in a set) and 10 (the best in a set) using a standard scaling formula. This approach assumes equal weights for the indicators and provides aggregate scores for three pillars – People, Society, Economy. Aggregated scores for the pillars Environment and Partnership are not calculated because they include indicators which are not directly comparable on an international scale (we used other indicators for Russia due to data availability issues). Aggregate scores for each BIN region and country are illustrated by maps in the report. On the maps we transform scores on 10-point scales into colour grades associated with the level of development. An integrated dataset with core values for each region and indicator can be made available to readers of this report upon request.

Wind turbines in Umeå Sweden
Photo: IStock/wayneknoesen

Issue #04
—March 2020

BUSINESS INDEX NORTH

Business Index North (BIN) is a project that contributes to sustainable development and value creation in the Arctic. The overall goal is to set up a recurring, knowledge-based, systematic information tool for stakeholders. This is the fourth issue of the "Business Index North" analytical report and focuses on the BIN area, including the northern regions of Norway, Sweden, Finland, and Russia. In future issues of the report we would like to include Alaska and the Northern Territories of Canada, Iceland and Greenland.

The BIN project is implemented through an international network of universities, research organizations, businesses and public sector institutions. The main implementing partner is the High North Center for Business and Governance at Nord University Business School. Nordland County Council and the Norwegian Ministry of Foreign Affairs provide basic funding for the BIN project.

www.businessindexnorth.com

NORD University / BUSINESS SCHOOL
KunnskapsParken Bodø
LULEÅ UNIVERSITY OF TECHNOLOGY
OULU BUSINESS SCHOOL UNIVERSITY OF OULU
RSHU