

《 研究ノート 》

Regional Development Policy in Northern Norway and Challenges in Self-sustaining Development: Focus on the Environment and Economic Infrastructure of the Arctic

Atsushi KAWAKUBO

1. Introduction

Norway and Japan differ greatly in their history and social and natural environments. They are separated by approximately 8,300 km in distance and 130° in longitude. As shown in Table 1, Norway is further north and has a climate ranging from temperate to freezing since the northern part is within the Arctic. Although its land area is similar its population of just over five million is less than 5% of that of Japan, thus its population density is much lower. Norway's GDP is below one tenth that of Japan's, but its economic growth is relatively high. The main industries of the two countries are also very different. That in Japan is manufacturing (e.g., automobiles, electronic equipment and machine tools), in contrast that in Norway is commodity processing (e.g., petroleum and gas, aquaculture and food processing). Additionally, Norway is a welfare state, so the public sector is more involved in the economy and society than that in Japan.

However, features common between Norway and Japan are not few. For example, they are both advanced countries each with a GDP per capita among the highest in the world. Besides similar size land area, their topography is similar, e.g., few plains, long coastlines, and many islands. The latter making them maritime nations; thus they have

Table 1 Comparison of the outline of Norway and Japan (2020)

	Norway	Japan
Main land range	58° ~ 71° N	27° ~ 46° N
Main land climate	Cfb ~ ET	Cfa ~ Dfb
Land area	323,802 km ²	377,915 km ²
Population	5,390,000	125,850,000
Population density	17/km ²	333/km ²
Capital population (share)	693,494 (12.9%)	9,733,276 (7.7%)
GDP	M\$ 405,510	M\$ 5,135,900
GDP per capita	\$75,700	\$40,690
Economic growth	1.47%	0.91%
Labor force by occupation		
Agriculture	2.3%	2.9%
Industry	33.7%	26.2%
Services	64.0%	70.9%
Main industry	petroleum and gas, shipping fishing, aquaculture food processing, shipbuilding pulp and paper products metals	automobiles electronic equipment machine tools steel and nonferrous metals ships, chemicals

Note: GDP is year 2019 and Labor force is year 2022.

Economic growth is annual average between 2015 and 2019.

Source: CIA The world fact book, IMF World Economic Outlook Databases
Statistics Norway, National census

a long history of fisheries and both have significant shipbuilding and shipping industries. In addition, regarding regional demographics, their respective populations are concentrated in the capital cities.

Given these circumstances, Japanese researchers have investigated various

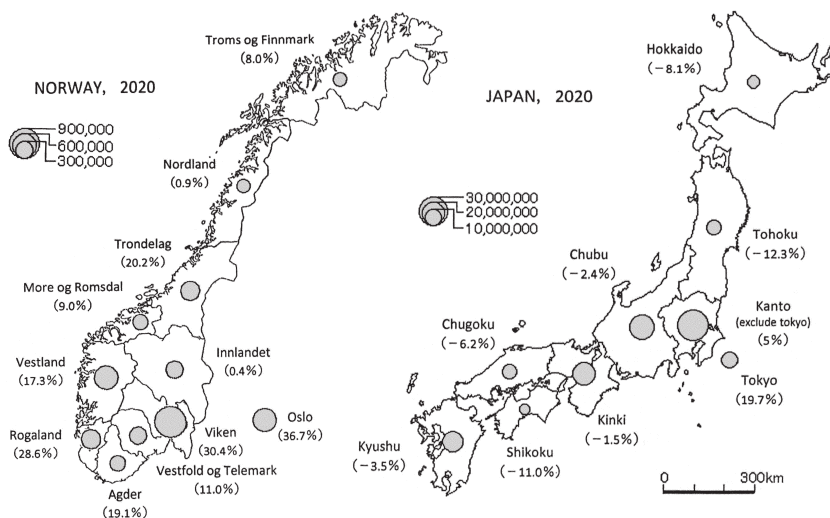


Figure 1 Comparison of regional differences in population distribution among Norway and Japan (2020)

Note: The figures shown as percentages indicate population growth ratio from 2000 to 2020 in each region. Thus in Hokkaido, the population decreased by just over 8% whereas it increased by 8% in Troms og Finnmark over the same 20-year period.

Source: Statistics Norway, National Census

Norwegian factors, including politics, economy, and society (Murai and Okushima 2004, Okazawa and Okushima 2004a ; Okazawa and Okushima 2004b). Recently, research in fishery, education, gender, and indigenous people has been increasing, however, economic-geographical research has not been much. Since globalization and population concentration in urban areas may negatively impact peripheral regions, and since Japan and Norway share similar urban-regional population disparities, researchers may ask what regional policies (public investment etc.) Norway employs to avoid problems that may result from urban-regional disparities.

Figure 1 shows demographic characteristics and trends over the last two decades in Norway and Japan. According to this figure, population concentrations in their respective capitals Oslo and Tokyo, and their metropolitan areas (Viken, Kanto), have

both witnessed high growth rates. However, those in the peripheral regions differ greatly. Namely, in Japan, except for the Tokyo and Kanto regions, there has been a decrease in regional populations, especially in northern and western Japan (e.g., Hokkaido, Tohoku and Shikoku) which seen decreases of about 10%. In contrast, Norway has experienced population growth throughout the country, with Troms og Finnmark in the northernmost regions increasing by about 8%. This phenomenon is mainly due to the Norwegian policy to balance development among regions.

This paper aims to clarify factors underlying population growth in Norwegian regions far from the capital city by focusing on the history of government regional development plans and local environment characteristics such as their strategic importance. This paper also considers the current situation regarding the main economies (aquaculture, oil and gas industry, tourism, and reindeer husbandry) of Northern Norway (especially, Troms og Finnmark county) on a macro scale, and discusses possible challenges and possibilities for Northern Norway regarding future self-sustaining development.

2. Background of Regional Development Policy and Public Investment in Northern Norway

2.1 The position of Northern Norway in Norwegian Arctic Policy

Currently, the status of Northern Norway in Norwegian regional policy is very high. According to a government white paper (Norwegian Ministries 2021), the aims of Norway's foreign and domestic policies converge in the Arctic. The background includes an agreement about delimitation of the continental shelf and the maritime boundary in the Barents Sea and Arctic Ocean between Norway and Russia that was signed in 2010, and that the navigable period in the Arctic Ocean has extended due to global warming. As a result, the feasibility of marine resource development in the area has been increasing, which means the Arctic has become a very important area geopolitically in Norway, therefore the development of Northern Norway located in the

Arctic is indispensable to secure Norwegian interests.

However, the population density in Northern Norway is low, and since the 1970s it has been relatively decreasing due to urbanization in Southern Norway. Consequently, the Norwegian government proposed a policy to reverse this decline which includes three main components. First is promoting job creation and value creation. This includes promoting innovation-based development due to cooperation between the business community and higher education sector. Second is being at the forefront of technological development. This involves promoting the sustainable use of natural resources and increasing added value by using Norwegian data on ocean, space, climate change, and health. Third is preserving the identity and culture of the indigenous community. Connecting Sami culture to cultural industries and tourism may result in positive spin-off effects such as job creation and value creation across the region.

On the other hand, fundamental challenges to reversing continuing population decline remain in Northern Norway. They include providing a good quality of life for the local people and good conditions for businesses to thrive in the area. Therefore, developing compact cities with pleasant physical surroundings, vibrant centers, access to a broad selection of goods and services, and cultural and leisure activities is being promoted. Additionally, it is essential that young people invest their future in the region. Thus, promoting international cooperation in the Arctic, securing better access to capital, enhancing the framework for education and skills development in outlying districts, and improving conditions for entrepreneurs is required. However, its high transport costs due to its distance from economic centers and its unpredictable weather in winter, pose obstacles to business development and population increase by people settlement in Northern Norway. Continuous effort to improve the transport and communication infrastructure is required.

2.2 Norwegian regional policy and public investment in Northern Norway

The aim of Norwegian policy to develop Northern Norway is not new. The Norwegian government has focused on correcting regional imbalances since the 1960s. To this end, the Regional Committee for Northern Norway established in 1974 promoted commercial policy focusing on competence development, information technology, and tourism (Tjelmeland 2000). Huge profits from petroleum resources enabled such regional policies underpinned by political agreement that balanced domestic development throughout the country will lead to national prosperity.

However, large regional differences in types of industries remain. Growth industries, e.g., financial business, engineering and R&D, are mainly located on the west coast and in large cities, whereas more traditional industries are mostly located in the inland regions of Southern Norway, in the fjord areas and in Northern Norway. Therefore, the Norwegian government relocated the central offices of some public sector institutions to depressed areas with the aim to generate positive effects in regional local labor markets (Norwegian Ministry of Local Government and Regional Development 2013). Relocation of public sector institutions created employment opportunities among populations in these deprived areas as state employees and supported decentralized settlement by providing high standard welfare services, and by doing so helped to sustain the population in Northern Norway. But this policy did not significantly induce regional development in terms of new company start-up firms or population growth (Stein 2019a, 2019b).

The Norwegian government has also been focusing on improving the transport infrastructure for many years. Figure 2 shows the distribution of airports and seaports in the region of Troms og Finnmark. There are 14 airports, including Tromsø (which offers international flights to six European countries) which was constructed in 1964 as the region's central hub airport. Among these 14 airports, Tromsø-, Alta-, Hammerfest-, Kirkenes-, and Bardufoss-airport offer direct flights to Norway's capital city, Oslo. Moreover, the other nine airports offer direct flights at least twice a day to Tromsø

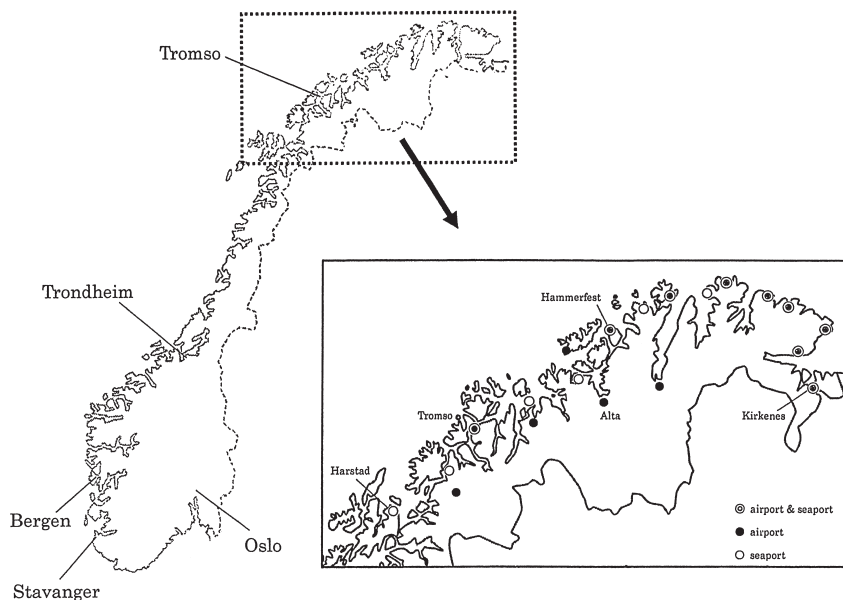


Figure 2 Locations of airports and main seaports for ferries in Northern Norway
Source: Avinor HP, Hurtigruten HP

(which has >10 flights/day to Oslo), so access to the capital city from the region is secured. Tveter (2017) reported that improvements in air transport networks can augment local economic development through four mechanisms. Firstly, by making a region more attractive. Secondly, by improving market access from coastal areas. Thirdly, by facilitating face to face contact and thereby increasing productivity through the creation and flow of ideas. Finally, by reducing the cost of obtaining information on remote sites by head office. These mechanisms play a major role in Northern Norway that is both far from economic centers and less populated.

The Norwegian coastal ferry service “Hurtigruten AS” (headquartered in Tromsø City) as a fleet of 11 ships and 34 ports of call among which there are 15 in the region of Troms og Finnmark as indicated in Fig. 2. There are northbound and southbound ships in service at least once a day. This service is not rapid as it takes a day and a half

from Tromsø to Kirkenes, but cars can be loaded as well as foot passengers. It helps people to reach relatively near destinations more easily because the road network in Northern Norway has limitations because of the many fjords. Since the southern terminus is Bergen, the service is also used as a cruise ship for a six or seven day tour along Norway's long coast stretching from north to south.

The Norwegian government also implemented new policies the 1960s towards economic social, and cultural development using higher educational institutions as an engine to drive growth in the peripheral region. As a result, University of Tromsø was established as the fourth university in Norway in 1968 (Musial 2013). Five university colleges established some years later in Harstad, Tromsø, Hammerfest, Alta, and Kirkenes (Figure 2) were merged with University of Tromsø in the 2000s. As the fourth largest educational institution in Norway, University of Tromsø employs 2,700 staff and educates around 12,000 students in six faculties specializing in natural sciences and social sciences. In addition, since the 1990s, various research institutions have been founded in the university, e.g., medical related (National Centre of Rural Medicine, Complementary and Alternative Medicine), theoretical related (Center for Advanced Study in Theoretical Linguistics, Center for Theoretical and Computational Chemistry), and Arctic related (Norwegian Polar Institute, Barents Institute), also Centre of Marine Resource Management, Centre for Sami Studies, and Centre for Peace Studies. These institutions are very important keys to realize the knowledge-based infrastructure envisioned in a government strategy High North Policy (2006) related to a wide range of fields including foreign policy, competence building, environment, indigenous people, marine resources, transportation, and oil exploration (Pinheiro 2014). In addition to the role of the university to help existing industries to diversify through research and discussion forums and to promote new industries by companies licensed to apply research activities, University of Tromsø is expected to stimulate local business in the fields of fisheries, medicine, and marine biotechnology (Isaksen and Karlsen 2010). Moreover, in 1991, University Hospital of Northern

Norway was established as the center of excellence for regional health care in Northern Norway. Approximately 6,300 staff are engaged in the treatment and of patients, research, and the training and education of health personnel, including at its satellite branch hospitals in Harstad and Nalvik in Nordland county, and in Longyearbyen, Svalbard archipelago.

As a consequence of the government policies described above, public sector provision (educational, research, medical institution) has been remarkable, mainly in Tromsø City, and has very much contributed to population growth in Northern Norway by inducing job creation, development of local economies, and improvement of local living environments. The role played by University of Tromsø in training medical doctors, schoolteachers, and graduate students, to work in Northern Norway (Musial 2013), shows the importance of higher education institutions in revitalizing regional areas.

3. Economic Infrastructure in Northern Norway and Challenges to Self-sustaining Development

As discussed above, for many years Norway has implemented a regional policy of aggressive public investment to achieve balanced development throughout the country. Thereby Northern Norway has maintained its relatively decentralized population distribution and the largest share of the regional labor force is the municipal sector (Norwegian Ministry of Local Government and Regional Development 2013). What method may build a self-sustaining local economy without depending on public investment? Next, we look at the present status of marine related industries (aquaculture, oil and gas exploration), which are distributed along the coasts of Norway, and the promotion of industrial development utilizing regional characteristics (Arctic environment, indigenous people) in Northern Norway with an eye to future development in the region.

3. 1 Development and challenges in the marine resource industry

3. 1. 1 Growth of aquaculture and Northern Norway

Although Norway's fishing industry employs less than 1 % of the nation's workforce, the value of exports of seafood ranks second to oil and gas, namely the seafood industry is one of main industries in Norway. The dominant commodity, farmed salmon, comprises almost 80% of Norway's seafood exports (Norwegian Seafood Council's HP) and at approximately 1.3 million tons comprise about 55% of annual global production of farmed salmon (Aquaculture Business editor 2019).

Salmon aquaculture in Norway was started in the early 1970s and production grew steadily with export demands, however, production stagnated following the outbreak of an infectious disease in 1984 (ISA, infectious salmon anemia) and deteriorating markets in the early 1990s (Olsen and Hagiwara 2003). From about the middle of the 1990s, as shown in Figure 3 sales started to recover, and both quantity and price have substantially increased. This recovery was mainly due to promotion of marketing by Norwegian Seafood Council founded in 1991. The council succeeded in developing new markets, e.g., U.S., Korea, China, in addition to Norway's existing markets for this product, e.g., EU, Japan, Russia (Aquaculture Business editor 2019). Although the production and export volumes have been relatively stagnant since 2012, the price trend increase continued to rise and prices remain at a historical high level, thus the profitability of salmon aquaculture is very high.

Salmon aquaculture is managed mainly in fjords, which are widely distributed along the coast⁽¹⁾. The industry employs approximately 10,000 people to rear and slaughter fish in the salmon production sector, and around a further 14,000 people in the intermediate manufacturing and service sectors (Hersoug 2015). Accordingly, this industry plays a very important major role in development of the local economy in surrounding areas. However, one may ask, are there any salmon farms in Northern Norway? Figure 4 shows change in salmon production in Norway by county over twenty years. According to the graph, production in Troms og Finnmark has rapidly

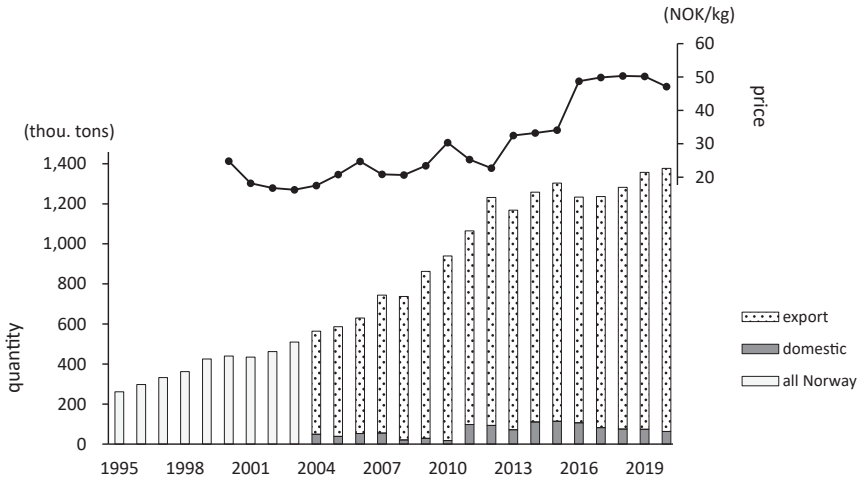


Figure 3 Trends in growth of production and price of sales in Atlantic salmon in Norway

Source: Directorate of Fisheries, "Key figure from Norwegian Aquaculture Industry"

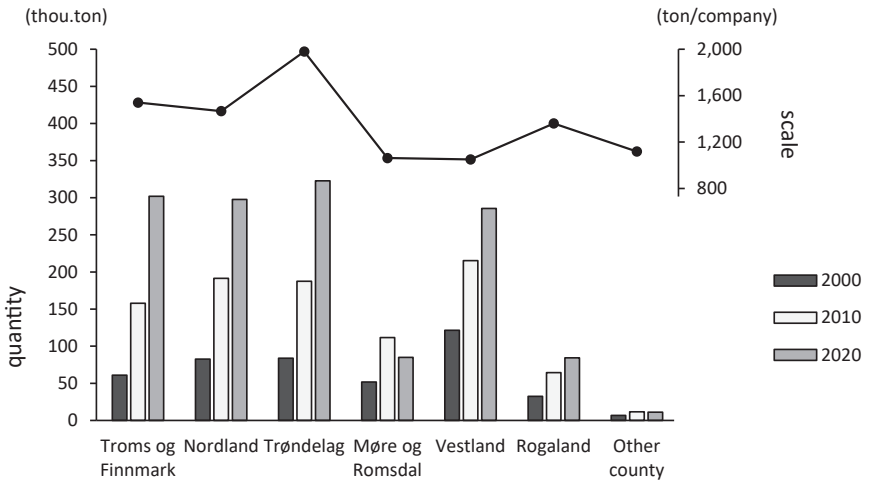


Figure 4 Changes in production of slaughtered Atlantic salmon by county

Source: Directorate of Fisheries, "Key figure from Norwegian Aquaculture Industry"

Table 2 Comparison of employment statistics of Norwegian salmon industry by county between year 2000 and year 2020

	employee		company		employee/company	
	2000	2020	2000	2020	2000	2020
Troms og Finnmark	411	1,389	54	21	7.6	66.1
Nordland	457	1,334	47	33	9.7	40.4
Trøndelag	448	1,333	32	19	14.0	70.2
Møre og Romsdal	346	734	43	14	8.0	52.4
Vestland	722	1,811	94	45	7.7	40.2
Rogaland	143	366	22	16	6.5	22.9
Other county	41	136	4	15	10.3	9.1
Total	2,568	7,103	296	163	8.7	43.6

Source: Directorate of Fisheries, “Key figure from Norwegian Aquaculture Industry”

grown since 2000 to make it one of the main production counties along with Nordland, Trøndelag and Vestland. According to the corresponding Table 2, the number of employees in Troms og Finnmark more than tripled over twenty years from 411 in year 2000 to 1,389 in year 2020, suggesting aquaculture grew to become one of the main industries in that county. However, in that county, the number of companies involved in aquaculture fell by more than half from 54 to 21 over the same period. This phenomenon followed a change in the license system in 1991. Until then, the Norwegian government had prioritized the approval of aquaculture licenses to small and medium-sized local companies to create local jobs in the rural coastal areas. The license system was changed to allow free transfer of licenses (Hersoug 2015) allowing mergers and acquisitions resulting in concentrations of ownership in the Norwegian salmon industry as a whole⁽²⁾. However, the expansion of company scale in Troms og Finnmark was more extensive than that in the other counties, and the number of employees per company and production per aquaculture site increased to be second

only to Trondelag (Table 2 and Figure 4). Nevertheless, Troms og Finnmark does not house the headquarters of any of the top 10 companies in Norway in terms of production, since the recent growth in this region is largely due to investments by large companies residing outside the region.

On the other hand, the future growth of salmon aquaculture faces challenges. According to Figure 3, production has been stagnant since 2012. This is partly due to restrictions in the issuance of new licenses in response to objections by public opinion to further growth of aquaculture in addition to a decline in suitable sites. The objections include two broad concerns about the environment, namely concerns about the natural environment itself, e.g., negative effects of sea lice, fish escapes, salmon feces, and production related chemicals; and concerns about competing human uses for the environment such as fishery and social activities, e.g., tourism, and leisure, (Bjørkan and Eilertsen 2020). Complaints in the former category voice serious questions about sustainability. In response, the Norwegian government introduced special licenses called “green” and “development” to manage the environment and aquaculture growth. The “green license” is granted to companies that employ solutions to reduce sea lice and prevent escapees (Hersoug 2015). The latter is granted to companies planning new projects that could lead to innovations such as large-scale offshore aquaculture (Kaneko 2020) in an effort to balance public concern about care of and access to the environment, and growth of the aquaculture industry.

Given these challenges, the prospect of further development in aquaculture on the Norwegian coast is unlikely or limited. However, Northern Norway has several advantages. These include the fact that aquaculture farms are relatively widely dispersed along the coastline so their density is low and suitable sites still remain, and the low temperature of the seawater makes salmon farming there less prone to parasitic infections by sea lice than elsewhere. Although the number of jobs on an average salmon farm itself is not high, an associated processing plant that is likely to be located in close proximity may employ over 100 people if large. Moreover, local service

industries can expect more demand, so the effect on job creation in the vicinity of an aquaculture project is extremely large. The headquarters of Norwegian Institute of Food, Fisheries and Aquaculture Research, and Norwegian Seafood Council are research and marketing bases, respectively. University of Tromsø has a number of fisheries-related faculties and institutes. All of these three bodies are based in Tromsø. If these bodies could cooperate and strive to create more added value in seafood products, the fishing industry could further stimulate and revitalize local economies in Northern Norway.

3. 1. 2 Prospects for the oil and gas industry in Northern Norway

The oil and gas industry comprises almost 20% of Norway's GDP, and is the largest industry in Norway. It employs over 60, 000 people, including those in related service sectors, and provides high remuneration (Statistics Norway). Most of its production is exported, and the huge profits have enriched the nation and supported its welfare state. In addition, since all Norwegian oil and gas fields are located offshore, the industry brings large spillover benefits to the manufacturing sector including construction and repair of drilling plants, pipelines, oil tankers, and liquefied natural gas (LNG) carriers, thus greatly contributing to the diversification of Norway's comprehensive industrial structure.

The history of oil production by Norway began with the discovery of the Ekofisk oil field in the North Sea in 1969 which began operations in 1971. As shown in Figure 5 , oil production by Norway had grown remarkably by the late 1990s making it one of the world's leading oil exporting countries, with the UK and Germany as its main markets (Moe 2010). However, Norway's annual oil production peaked at 194 million Sm³ o.e. (standard cubic meter of oil equivalent) in the year 2000 then began to decline and is now surpassed by gas production, which has grown rapidly since the late 1990s. In terms of location, oil and gas production in the North Sea has decreased since the late 1990s, and currently the share of Norway's total production contributed by the

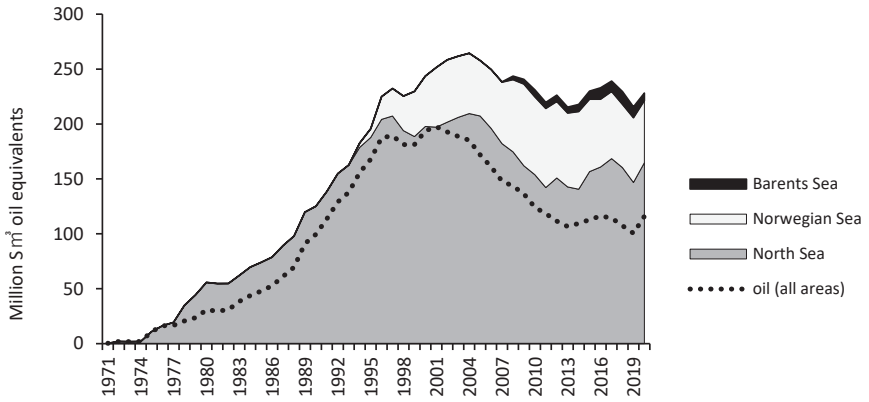


Figure 5 Longitudinal trend in Norway's oil and gas production
 source: Norwegian Ministry of Petroleum and Energy HP "Fact"

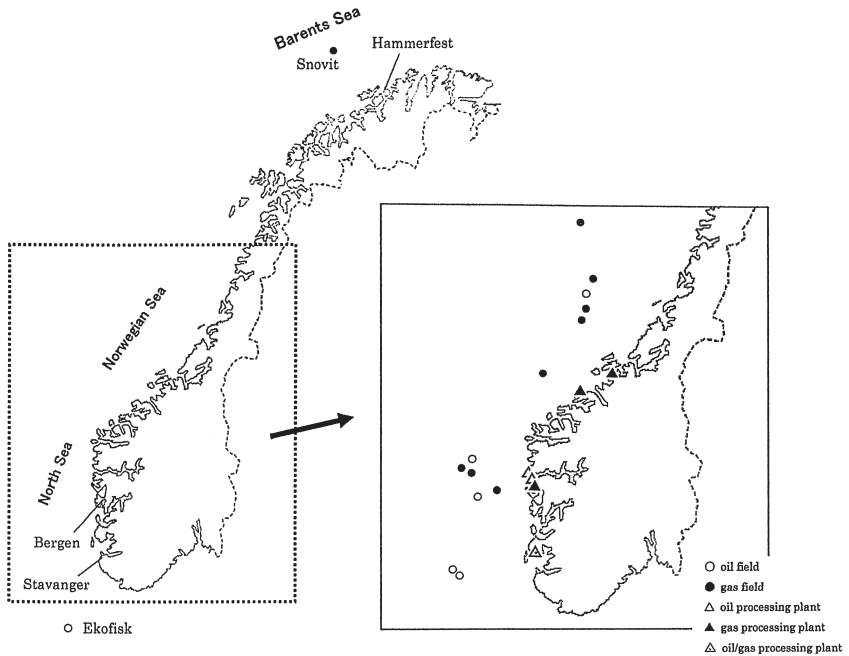


Figure 6 Sites of Norway's oil and gas fields and associated processing plants
 Source: Norwegian Ministry of Petroleum and Energy HP "Fact"

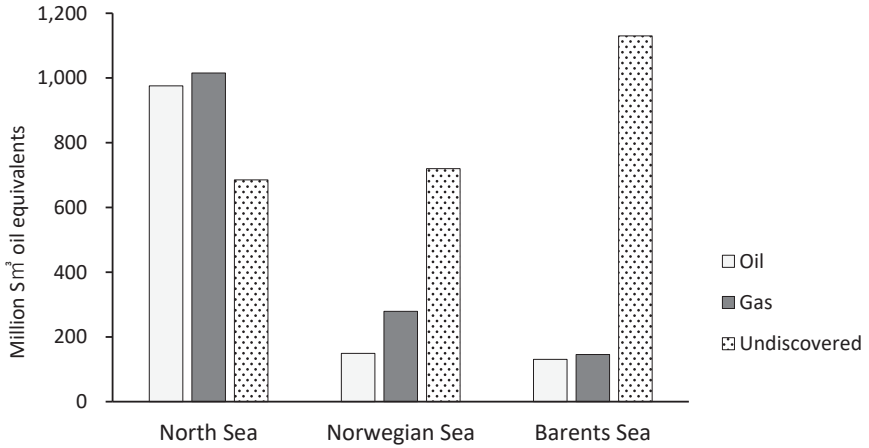


Figure 7 Estimated (2020) reserves of oil and gas and undiscovered resources
 source: Norwegian Ministry of Petroleum and Energy “Fact”,
 Norwegian Petroleum Directorate “Resource Report Exploration 2020”

Norwegian Sea has increased to almost 30%. Although oil and gas production in the Barents Sea started in the 2000s, annual production of oil and gas by Norway as a whole peaked in 2004 at 264 mill. Sm³ o.e. and declined to around 230 mill. Sm³ o.e. in recent years.

However, one may ask, where are Norway’s oil and gas fields and related facilities? Figure 6 shows the distribution of Norway’s top 15 oil and gas fields in terms of o.e. production in 2020 and their associated plants including refining, processing LPG (liquefied petroleum gas), and export operations. According to this figure, eight, or over half of the production fields, are located in the North Sea, six in the Norwegian Sea, and only one is in the Barents Sea. In terms of oil and gas⁽³⁾, most fields in the North Sea are oil, whereas those in the Norwegian and Barents Sea are mainly gas. Therefore, regarding the ratio of oil to gas production, the recent growth in gas is largely due to decreased oil production in the North Sea accompanied by increased gas production in the Norwegian Sea. In addition, four of the seven oil and gas processing

plants are located along the North Sea coast (three north of Bergen, one north of Stavanger), and most oil and gas company headquarters are located in Stavanger on the North Sea coast (13 of the top 15 companies in terms of production in 2020). Thus the economic ripple effects of the oil and gas industry have been limited to Southern Norway.

For Northern Norway, one might ask about the possibility of better exploiting oil and gas reserves in the Barents Sea in the future. Oil and gas production began in the Barents Sea in 2007 and grew slowly thereafter to reach just 4% share of total Norwegian production (Figure 5). Although the potential of abundant oil and gas resources has been known since the 1980s, the main reason for paucity in production is that the Norwegian government demands safeguards against environmental vulnerabilities of the Arctic environment (e.g., zero oil pollution to protect the fishing industry, especially rich sources of cod, and to safeguard biodiversity) when granting exploration licenses. Therefore, hydrocarbon exploration in the Barents Sea has been restricted (Hasle *et al.* 2009, Moe 2010) resulting in there being only two fields in operation in the Barents Sea, namely Snovit and Goliat. While the remaining reserves of oil and gas in the Barents Sea is less than those in the North Sea and the Norwegian Sea, the amount of undiscovered oil and gas in the Barents Sea is estimated to be 1,130 mill. Sm³ o.e., which corresponds to 45% of Norway's current total (Figure 7). Moreover, it is expected that there are undiscovered reserves in the Svalbard archipelago (a.k.a. Spitzbergen) of about 1,370 mill.Sm³o.e. (Resource Report Exploration 2020), so the potential for oil and gas exploration in Northern Norway is very high.

Nevertheless, various challenges present to oil and gas exploration in the Arctic in addition to conservation. One challenge is related to geography. The cold and darkness of winter will necessitate higher pay and more time off for personnel, as well as reduce efficiency in operations such as exploration and maintenance. Also, the remoteness from economic centers requires higher costs in terms of logistics of bringing in the

infrastructure and human resources (Overland *et al.* 2015, Takahashi 2017). Another challenge is related to politics. In the long term a drastic decrease in oil and gas demand may result from international pressure for a low carbon economy and the shift to alternative energy. Furthermore, the Russian invasion of Ukraine in 2022 has made joint ventures with Russia in the east Barents Sea unlikely.

While there are many challenges to realize the potential of oil and gas resources in Northern Norway, overcoming them may bring significant benefits to the region. For example, because oil and gas fields in the Barents Sea are far from those serviced by facilities in central and southern Norway (Figure 6), facilities to service the northern fields may have to be built locally⁽⁴⁾. And if oil and gas exploration in the Barents Sea is implemented successively thereafter, the area around Hammerfest, which is already connected by pipeline to the Snovit field, will see the expansion of processing facilities and development of associated service industries. Even on a small scale, this would be significant for Finnmark district (east half of Troms og Finnmark county) which has low population density and depends on primary industry.

3.2 Current status and challenges of industrial promotion utilizing regional characteristics

3.2.1 Characteristics and challenges of tourism in Northern Norway

The tourism industry, including related service sectors, accounted for 4.2% of Norway's GDP and employed 7.1% of Norway's workforce (169,000 people) in 2018, and continues to grow. Figure 8 shows the trend in overnight stays at commercial establishments such as hotels, campsites, cabin villages, and youth hostels in Norway. The total number increased from approximately 26 million in 2005 to 35 million in 2019. The number of foreign tourists, mainly from Europe, U.S. and China, also increased to comprise over 30% of overnight stays across Norway. In the same period, in Northern Norway stays increased from 131,000 to 217,000, driven mainly by overseas tourism, which accounted for 40% of all stays in the region in 2019.

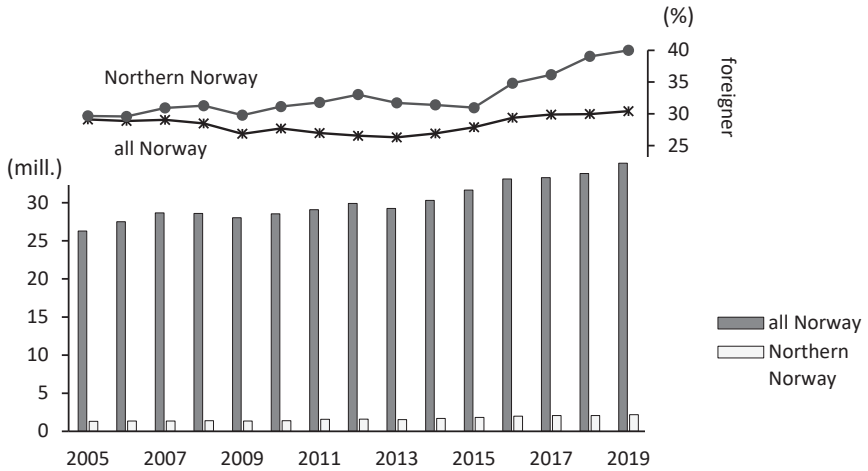


Figure 8 Trend in overnight stays and percentage of foreigner at commercial establishment in all of Norway and Northern Norway
 source: Statistics Norway

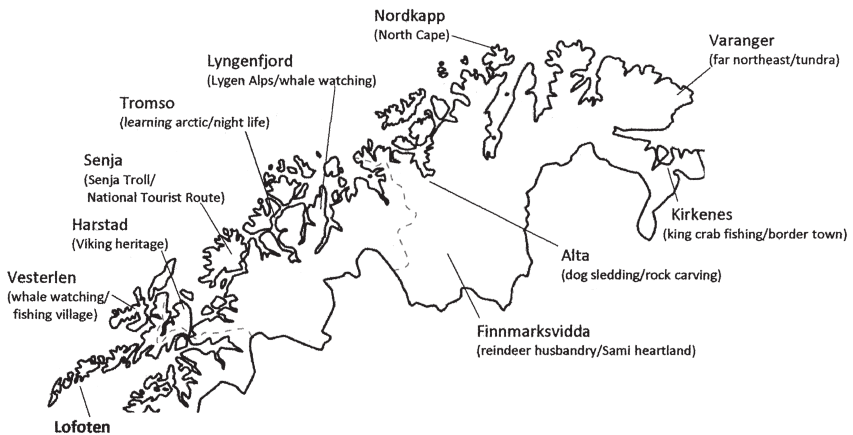


Figure 9 Major tourist destinations and their attractions in Northern Norway
 Source: NordNorsk Reiseliv AS's HP

Table 3 Comparison of growth in hotel accommodation and overnight stays in two northern counties

	Nordland		Troms og Finnmark			
			Troms		Finnmark	
	2005–09 average	2015–19 average	2005–09 average	2015–19 average	2005–09 average	2015–19 average
Number of hotels	80	90	40	43	42	41
Rooms/hotel	46	49	61	79	47	63
Sales (NOK 1,000)	406,386	714,688	340,665	674,018	199,066	306,833
Overnight stays	778,487	1,074,740	625,882	1,119,279	348,045	471,305
(Conference)	87,966	96,920	106,747	124,055	33,287	28,821
(Occupation)	326,510	438,610	297,881	380,538	128,330	191,995
(Holiday)	364,010	539,210	221,255	614,686	186,428	250,489
(Spring)	19.4%	20.3%	21.3%	20.5%	18.2%	20.5%
(Summer)	45.1%	42.1%	34.7%	29.3%	49.4%	42.3%
(Autumn)	21.2%	22.2%	25.0%	23.5%	18.9%	20.4%
(Winter)	14.3%	15.4%	19.0%	26.7%	13.5%	16.8%

Note: Spring is March to May, Summer is June to August, Autumn is September to November, Winter is previous year's December to the year's February.

Source: Statistics Norway

Northern Norway has many unique natural, cultural, and social resources, such as the northern lights, Sami culture, and outdoor activities. The Norwegian government sees the tourism industry as a sector of job creation and income growth and aims to create sustainable rural communities by developing industry in Northern Norway (Amundsen 2012). As shown in Figure 9, the main tourist destinations are distributed widely across the region, with resources rich in diversity including pristine landscapes (mountains, capes, and tundra), nature based activities (whale watching, crab fishing and dogsledding), social history (border towns, rock carvings, and Vikings), and

culture (reindeer herding, Sami traditions, and fishing villages).

Then, one may ask, what has characterized the recent growth of tourism in Northern Norway? Table 3 compares growth in number of hotel accommodations and customer type among two counties (Troms og Finnmark, and Nordland) of Northern Norway between 2005-09 and 2015-19. Numbers of overnight stays increased in all three districts of the two counties, with stays in Troms district (west half of Troms og Finnmark county) exceeding stays in Nordland county during the most recent five years on record. The number of hotel accommodations and sales also increased in Troms district, with the main driver being holidaymakers. In addition, the proportion of winter stayers increased greatly in Troms compared to the other two districts. The proportion of overseas visitors exceeded 40% in 2019 (Statistics Norway), seeking attractions such the northern lights experience (Amundsen, 2012).

Therefore, the recent growth of overnight stays in Northern Norway has been driven by Troms district. Background factors include excellent access to Troms City. Tromsø airport is the sole international airport in Northern Norway and a gateway for foreign tourists. Moreover, Tromsø port is a main port of call for cruise ships with demand increasing recently⁽⁵⁾, and tourism in Tromsø City is augmented by its connection to neighboring destinations such as Lyngenfjord and Senja by ferry and bus (Figure 9). In addition, many conferences are held in Troms district since Tromsø City hosts many research institutions such as University of Tromsø and has an excellent air transport network and relatively large capacity hotels (Table 3). Since most conferences are held at low peak tourist periods and bring high profits (Key Figures for Norwegian Travel and Tourism) they are significant to hotel management.

Since the numbers of overnight stays also increased in districts other than Troms (Table 3), it is hopeful that tourism as a pillar industry will lead to regional development. However, there are some challenges. First is the fact that employment in tourism is seasonal, with the high season for tourism in Northern Norway being mostly summer when many transient workers are employed. Although it may benefit a region

if seasonal workers settle to become new rural residents⁽⁶⁾, it is rare for them to remain long term or permanently due to harsh natural environment and low job status (Tuulentie and Heimtun 2014). Second is overtourism. Many nature-based attractions are offered by family-owned tourism businesses in the western archipelago of Northern Norway. Although these areas depend on tourism for their economy, they do not want it to adversely affect their local traditional lifestyle and culture (Amundsen 2012). Despite a fear of overtourism, a third challenge relates to scale and finance. Due to the small scale of their businesses, they lack sufficient funds to invest in long-term strategies. Finally, sustainability is also of major concern for these businesses because attractions such as whale watching which rely on weather and environmental conditions may be adversely impacted by climate change or fluctuations in seawater temperature (Rauken and Kelman 2012). There are many small-scale tourist destinations including inland areas inhabited by Sami in Finnmark district. This district has been promoting collaboration among outdoor activities and local cuisine, e.g., king crab fishing, dogsledding, and reindeer grazing to distinguish their district among destinations. Although small scale, this method brings positive effects to local communities by tourists consuming local food and culture (Kristensen 2017). This approach is significant in terms of enabling sustainable rural communities without overtourism.

3. 2. 2 Indigenous people and reindeer husbandry

The presence of indigenous Sami in the northern part of the Scandinavia Peninsula is a major unique factor of cultural identity in Northern Norway. The Sami parliament was founded in 1989, and the rights of Sami as indigenous people are widely recognized and of concern (Tjelmeland 2000). About 3, 000 of the 50, 000 Sami population in Norway are involved in reindeer husbandry, which contributes to the local economy and job creation. Reindeer husbandry plays important roles in Sami culture, society, and language, and the byproducts, such as fur items and handicrafts,

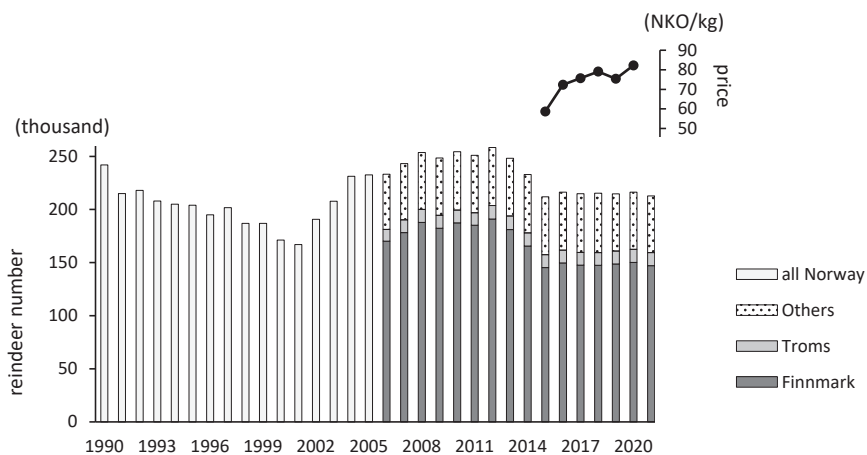


Figure 10 Change in reindeer numbers and carcass price in Norway
 Source: Norwegian Directorate of Agriculture's HP, Næss et al (2011)
 Pape and Löffler (2012)

have become a common symbol of the Sami (Norwegian Directorate of Agriculture's HP).

Reindeer husbandry in Norway introduced machine technology and snowmobiles in the 1960s to become a modern, high-cost, market-oriented industry⁽⁷⁾. Reindeer numbers have increased rapidly since the 1970s and exceeded 250,000 in the late 1980s (Pape and Löffler 2012). However, profitability is low, and most herders cannot sustain themselves on husbandry alone, mainly meat sales, and depend on income from other industries (e.g., handicrafts, fishing, hunting, and tourism) or pensions. They also receive financial subsidies and compensation thus reindeer husbandry is not necessarily self-sustaining, and a herder's income is far below average in Norwegian society (Jernsletten and Klokov 2002).

So, is there an expectation of growth in reindeer husbandry as an industry in the future? Reindeer meat has been described as "the taste of Tundra" and healthy meat from grazing in nature. Demand is strong, especially among young adults (Ministry of Agriculture and Food's HP). However, despite the rapid rise in numbers from the

1970s to late 1980s, the numbers of reindeer declined throughout the 1990s as shown in Figure 10. The main factors of change in the 1990s include difficulty accessing lichen beneath snow in severe winter and predation by wolverine, eagle, lynx, wolf, and bear. At the same time, critics contending that “over grazing”⁽⁸⁾ causes “ecological disaster” impeded the sustainability of reindeer husbandry (Pape and Löffler 2012). Subsequently, numbers started to regain returning to 250, 000 by 2010, purportedly due to recovery of pasture resources and predation compensation obviating the need to slaughter for income (Næss et al 2011). However, numbers again decreased in the mid-2010s, to remain around 210, 000 in recent years, because the Norwegian government enacted the 2007 Reindeer Act which set upper limits on reindeer numbers by grazing area to avoid overgrazing. Consequently, destocking in Finnmark district, the largest reindeer grazing area, was remarkable (Johnsen 2018). In contrast, it is argued that upper limits for grazing should reflect factors impacting growing conditions of lichen including climate and environment understood by people indigenous to the area. However, today, “over grazing” is the dominant narrative among Norwegian media, popular political parties, and environmental organizations (Benjaminsen et al 2015).

Even if the Reindeer Act were rescinded, competition with other industries, e.g., infrastructure development, wind and hydropower, military activities, agriculture, tourism, and mineral exploration, makes it difficult to expand the area available for reindeer husbandry (Johnsen 2016), which has already affected half of reindeer pastureland in Northern Norway (Jernsletten and Klovov 2002). In addition, future Sami generations may be unwilling to continue the low-income lifestyle.

Therefore, the practical challenge for reindeer husbandry in Northern Norway is to sustain rather than grow the industry in the future. Reindeer husbandry in Finnmark, with its low population density is an important employment opportunity, which may be enhanced by partnership with the tourism industry. Tourism promotion (activities, food, and art) that emphasizes the unique Arctic environment where reindeer

husbandry can be seen will greatly contribute to differentiate the place from other tourist destinations, and may bring significant extra employment opportunities for the Sami people.

4 . Conclusion

Norway and Japan are far apart and differ greatly in their history, social, and natural environments, and share common features, e.g., long land mass extending north to south, and demographics with large populations concentrated in the capital city and the metropolitan area. However, the recent regional trend in Norway's population differs in that growth is in peripheral regions far from the capital city. This paper investigated factors of sustainable development in peripheral regions, in terms of Norway's history of regional policy and economic infrastructure, and found the following points.

First of all, Norway advocates regional policies that balance development throughout the country and is a welfare state with a long history of good finance⁽⁹⁾. Especially, development in Northern Norway (Troms og Finnmark) is held most important. The background includes change in the political and economic environments (growing strategic importance) of the Arctic. In Northern Norway, public investments have been made since the 1960s to develop infrastructure and relocate public institutions. Especially, construction of the central hub airport and formation of an airline network improved access to the capital city, quality of life, and business activities in the region. Moreover, higher educational institutions were established, including University of Tromsø in 1968 which is now Norway's 4th largest educational institution. Together with its affiliated research institutions it promotes industrial development as a knowledge-based infrastructure. In 1991, the University Hospital was established in Tromsø City. This medical center contributes to population growth in Northern Norway through improved living conditions.

In terms of economic infrastructure, there are currently no industries in Northern Norway with significant job creation potential. However, major export industries

including aquaculture, oil, and gas are located in Northern Norway. Regarding salmon aquaculture, Northern Norway has more capacity for additional sites than does Southern Norway, and the lower seawater temperature in the north brings an advantage in sea lice management. As for oil and gas exploration, it is expected that some 45% of Norway's undiscovered resources that can be developed are below the Barents Sea. Although industries utilizing the unique nature, history, and culture of Northern Norway such as tourism and reindeer husbandry bring environmental concerns, e.g., excessive tourism and grazing; these industries are attractive to differentiate Northern Norway from other destinations. If these industries are developed according with local needs rather than economies of scale, beneficial economic and social ripple effects may spread throughout Northern Norway.

In conclusion, although Northern Norway has a harsh winter and few urban amenities, it has the potential to develop a self-sustaining economy. To accomplish this and attract and retain skilled workers from the densely populated South, local governments must provide attractions to transient students and workers, as well as immigrants. Some small-sized cities in Finnmark district should become mid-sized like Tromsø City. While inland Finnmark Sami reindeer husbandry areas may not suit large-scale development, Hammerfest and Alta are promising candidates.

The buds of economic development in Northern Norway described in this paper are related to international relations as well as environment issue. The relation to foreign market is very important for Norway that the domestic market is small, thus world peace is the starting point of Norwegian national prosperity. And the relation to indigenous people is also common domestically.

Notes

- (1) The distribution of aquaculture licenses in 2007 spreads from Vestland to Trøndelag that have many long fjord (Otero et al, 2011, p. 3).
- (2) Sales share of top 10 companies increased rapidly from 18.9% in 1996 to 69.1% in 2012

(Directorate of Fisheries).

- (3) Sites that produce both oil and gas are categorized by total cumulative production.
- (4) Processing plants are not necessarily near fields. Four of the six fields in the Norwegian Sea connect to processing plant located north of Stavanger by long pipeline as shown Figure 6.
- (5) In 2019, of approximately 3.3 million cruise passengers in Norway, Tromsø port handled 155,000, which is a record for this Northern Norway port (Key Figures for Norwegian Travel and Tourism).
- (6) Tuulentie and Heimtun (2014) divide seasonal workers into types among which those most likely to settle are “hobbyists” focused on skiing, and “professional holiday-employees” who would stay if they could further their career.
- (7) Some 50% of reindeer husbandry costs pertain to mechanical equipment, and 80-90% if transport and construction is included. Repayment of large investments in snowmobiles and quad bikes contribute to low disposable income (Jernsletten and Klokov 2002).
- (8) Norwegian society view high reindeer populations as risks to biodiversity, animal welfare, global warming, and excessive land occupation (Johnsen et al 2015).
- (9) In 1990s Japan the pillar of regional policy changed from “equality and balance” to “equal opportunities and self-reliance”, and public investment in peripheral regions was significantly reduced. Hokkaido and Okinawa Development Agencies, that oversaw development in north and south peripheral regions of Japan, were abolished in 2001.

References

- Amundsen, H. (2012). Differing discourses of development in the Arctic: The case of nature-based tourism in Northern Norway. *The Northern Review*, 35 (2), 125-146.
- Aquaculture Business editor (2019). Sekaisaidai no samon seisankoku noruwe no yousyokusangyou to syubyouseisan (Aquaculture industry and seedling production in “the biggest salmon producing country” Norway), *Yousyoku Bijinesu (Aquaculture Business)*, (in Japanese), 56 (1), 7-9.
- Benjaminsen, T. A., Reinert, H., Sjaastad, E., and Sara, M. N. (2015). Misreading the Arctic landscape: A political ecology of reindeer, carrying capacities, and overstocking in Finnmark,

Norway. *Norsk Geografisk Tidsskrift-Norwegian Journal of Geography*, 69 (4), 219-229.

Bjørkan, M. and Eilertsen, S. M. (2020). Local perceptions of aquaculture: A case study on legitimacy from Northern Norway. *Ocean and Coastal Management*, 195, 1 -10.

Hasle, J. R, Kjellén, U. and Haugerud, O. (2009). Decision on oil and gas exploration in an Arctic area: Case study from the Norwegian Barents Sea. *Safety Science*, 47, 832-842.

Hersoug, B. (2015). The greening of Norwegian salmon production. *Maritime Studies*, 14 (16), 1 -19.

Isaksen, A. and Karlson, J. (2010). Different modes of innovation and the challenge of connecting universities and industry: Case studies of two regional industries in Norway. *European Planning Studies*, 18 (12), 1993-2008.

Jernsletten, J. L. and Klokov, K. (2002). Sustainable Reindeer Husbandry. http://www.reindeer-husbandry.uit.no/online/Final_Report/final_report.pdf (accessed 31 March 2022).

Johnsen, K. I. (2016). Land-use conflicts between reindeer husbandry and mineral extraction in Finnmark, Norway: contested rationalities and the politics of belonging. *Polar Geography*, 39 (1), 58-79.

Johnsen, K. I. (2018). Conflicting knowledges, competing worldviews: Norwegian governance of Sámi reindeer husbandry in West Finnmark, Norway. Norwegian University of Life Sciences.

Johnsen, K. I., Benjaminsen, T. A., and Eira, I. M. G. (2015). Seeing like the state or like pastoralists? Conflicting narratives on the governance of Sámi reindeer husbandry in Finnmark, Norway. *Norsk Geografisk Tidsskrift-Norwegian Journal of Geography*, 69 (4), 230-241.

Kaneko, T. (2020). Noruwhē ni okeru saisenanyōsyōkugijūtu: genzai to syourai (High technology of aquaculture in Norway: Present and future), *Suisanshinko (Fisheries Promotion)*, (in Japanese), 54 (1), 1 -51.

Kristensen, A. D. (2017). Food as an element in developing tourist experiences. A case study of the Finnmark region in Northern Norway. <https://munin.uit.no/handle/10037/11166> (accessed 4 March 2022).

Moe, A. (2010). Russian and Norwegian petroleum strategies in the Barents Sea. *Arctic Review on Law and Politics*, 1 (2), 225-248.

- Murai, M., Okushima, T. (eds) (2004). *Noruwhe no syakai (Society of Norway)*. (in Japanese), Waseda University Press, Tokyo.
- Musial, K. (2013). University and regional development in the Northern European periphery: The case of the University of Tromsø. *Universities, Cities and Regions—Loca for Knowledge and Innovation Creation*, 349-367.
- Næss, M. W., Bårdsen, B. J., Pedersen, E., and Tveraa, T. (2011). Pastoral herding strategies and governmental management objectives: predation compensation as a risk buffering strategy in the Saami reindeer husbandry. *Human Ecology*, 39 (4), 489-508.
- Norwegian Ministries (2021). The Norwegian Government's Arctic Policy: People, opportunities and Norwegian interests in the Arctic. https://www.regjeringen.no/en/dokumenter/arctic_policy/id2830120/ (accessed 17 February 2022).
- Norwegian Ministry of Local Government and Regional Development (2013). On Rural and Regional Policy. Report No. 13 to the Storting (2012-2013).
- Okazawa, N., Okushima, T. (eds) (2004a). *Noruwhe no seiji (Politics of Norway)*. (in Japanese), Waseda University Press, Tokyo.
- Okazawa, N., Okushima, T. (eds) (2004b). *Noruwhe no keizai (Economy of Norway)*. (in Japanese), Waseda University Press, Tokyo.
- Olsen, Y., Hagiwara, A. (2003). *Noruwhe youshokugyo no genjou to syoraitenbou (Current situation and future outlook of aquaculture in Norway)*, *Yousyoku (Aquaculture)*, (in Japanese), 40 (9), 26-30.
- Otero, J., Jensen, A. J., L'Abée-Lund, J. H., Stenseth, N. C., Storvik, G. O. and Vøllestad, L. A. (2011). Quantifying the ocean, freshwater and human effects on year-to-year variability of one-sea-winter Atlantic salmon angled in multiple Norwegian rivers. *PLoS ONE*, 6, e24005.
- Overland, I., Bambulyak, A., Bourmistrov, A., Gudmestad, O., Mellempvik, F., and Zolotukhin, A. (2015). Barents Sea oil and gas 2025 Three scenarios. In Bourmistrov, A., Mellempvik, F., Bambulyak, A., Gudmestad, O., Overland, I. and Zolotukhin, A. (eds), *International Arctic Petroleum Cooperation: Barents Sea scenarios* (pp. 11-31). Routledge.
- Pape, R., and Löffler, J. (2012). Climate change, land use conflicts, predation and ecological

- degradation as challenges for reindeer husbandry in Northern Europe: What do we really know after half a century of research? *Ambio*, 41 (5), 421-434.
- Pinheiro, R. (2014). Regional Policy and Higher Education: The Case of Northern Norway. In Aarevaara, T. and Berg, E. (eds), *Higher Education and Research in Academe - Who should pay?* (pp. 53-64). Luleå: Luleå Tekniska Universitet.
- Rauken, T. and Kelman, I. (2012). The indirect influence of weather and climate change on tourism businesses in Northern Norway. *Scandinavian Journal of Hospitality and Tourism*, 12 (3), 197-214.
- Stein, J. (2019a). What Happened in Northern Norway? : A comparative and quantitative analysis of political and demographic development in Northern Norway from 1950 to 2015. Available at <https://munin.uit.no/handle/10037/16364> (accessed 17 February 2022).
- Stein, J. (2019b). The local impact of increased numbers of state employees on start-ups in Norway. *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography*, 73 (3), 156-167.
- Takahashi, T. (2017). Noruwhe to sono hokkyokukeniki ni okeru sekiryu gasu tankoukaihatu no joukyu to tenbou (Status of Oil and Gas Exploration and Production of Norway and its Arctic Region), *Kanchi gijutsu ronbun houkokusyu (Proceedings of Cold Region Technology Conference)*, (in Japanese), 33, 30-35.
- Tjelmeland, H. (2000). The Making of a Sub-Arctic Region: Northern Norway, 1900-2000, Nineteenth International congress of Historical Sciences, Oslo (Specialized Themes, 9. Regions and regionalization). <https://www.oslo2000.uio.no/english/index.htm> (accessed 17 February 2022).
- Tuulentie, S. and Heimtun, B. (2014). New rural residents or working tourists? Place attachment of mobile tourism workers in Finnish Lapland and Northern Norway. *Scandinavian Journal of Hospitality and Tourism*, 14 (4), 367-384.
- Tveter, E. (2017). The effect of airports on regional development: Evidence from the construction of regional airports in Norway. *Research in Transportation Economics*, 63, 50-58.