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8 RESEARCH ON ENERGY RESOURCE DEVELOPMENT IN THE RUSSIAN ARCTIC: NEW CHALLENGES

Shinichiro Tabata

Introduction

The purpose of this chapter is to consider the influence of Russia's invasion of Ukraine on the Arctic research project with which I have been involved. In Japan, its flagship project of Arctic studies, entitled "Arctic Challenge for Sustainability (ArCS) II," has been carried out since 2020. I am engaged in its sub-program that studies energy resource development in the Russian Arctic and its influence on local economies and societies. We have paid special attention to mineral resource development in the Sakha Republic and Yamal-Nenets Autonomous Okrug (AO). Our original plan was to conduct field research in these two regions. However, Covid-19 hampered this in 2020 and 2021. In 2022, when we started preparing for the field survey in the Russian Arctic, Russia invaded Ukraine.

In this chapter, I will first explain how our project had been progressing until the beginning of 2022. I will then describe how our research plan has been affected by the war and what we have been doing since 2022, including pursuing the studies on the influence of the war on Russia's Arctic regions, exchanges with Russian researchers, and visits to Arctic regions outside Russia. In the conclusion, I will touch on future development in our research.

Our project before 2022

Japan's flagship project of Arctic studies

In Japan, the flagship project of Arctic studies, named ArCS II, was adopted by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and started in June 2020. This project is mainly carried out by three institutions: the National Institute of Polar Research (NIPR), Japan Agency for Marine-Earth Science and Technology (JAMSTEC), and Hokkaido University. It is scheduled to continue until March 2025. ArCS II is a successor project to ArCS, which was implemented by the same three institutions from 2015 to 2019. One of the major characteristics of ArCS was that researchers from the humanities and social sciences participated for the first

time in Japan's large-scale Arctic research: it incorporated as one of its eight research themes "People and community in the Arctic: Possibility of sustainable development," for which I served as principal investigator.[1]

More researchers in the humanities and social sciences are participating in ArCS II, as the need to study the Arctic from these disciplines has been recognized in Japan. ArCS II includes 11 research programs, one of which is entitled "Human Security, Energy, and Food in the Arctic under Climate Change" ("Human Society" in short), led by Hiroki Takakura of Tohoku University. This program consists of three sub-programs. I am responsible for one of them, entitled "Energy resource development and regional economy," which aims to study the impact of energy resource development on regional economies in the Russian Arctic, particularly in the Sakha Republic and Yamal-Nenets AO. Most of the members of our sub-program were specialists in the Russian economy, or area studies researchers of Russia. We had planned to carry out field surveys in Sakha and Yamal and to proceed with our research based on the results of these surveys. When talking about the impact on the local economy, we were interested in the impact on the economy at the municipal level, which is more closely tied to the lives of residents, locals, and Indigenous people. For example, out of 36 municipalities (districts and cities) in Sakha, 20 municipalities have populations of less than 20,000, of which nine have less than 5000. Note that Sakha's total population is 995,686 according to the 2021 Census.[2]

Influence of Covid-19

However, due to the effects of the coronavirus, we were unable to travel overseas for two years from 2020. Looking back, I may say that over the two years we learned how to proceed with research without conducting field surveys. For the kind of area studies that we pursue, field research is indispensable, but for two years we were faced with the problem of what to do when this is simply not possible.

The following two points are noteworthy in our response to this situation. The first is to further strengthen collaboration with Russian researchers. Many of our members are economists, and data is essential for conducting any kind of analysis. If we can conduct field research, we can visit local research institutes, government organizations, statistical offices, etc. and collect data by ourselves, but in situations where this is not possible, we have to rely on local researchers. In particular, we worked hard to obtain data at the municipal level. The issue here is that such collaboration brings great benefits to us, but what about for the Russian researchers? All we could do was pay them an honorarium. Inviting them to Japan and exchanging opinions on research had become standard practice when collaborating with Russian researchers after the collapse of the Soviet Union, but this was not possible due to the coronavirus pandemic.

1 See Tabata et al. (2021) for more details of this theme.

2 https://14.rosstat.gov.ru/folder/179476 [accessed 3.07.2024]

The second point regards the use of online communications. During the pandemic, online meetings progressed dramatically in Japan, including their use in exchanges with foreign researchers. However, as an incentive for collaboration with us, it is natural that being invited to Japan greatly outweighs having a talk online. It is unclear how much the Russian researchers wanted to talk online.

One of the first results of our sub-program initiated at ArCS II (Tabata 2021) clarifies how the mining sector contributes to regional economic growth and budget revenues in the Sakha Republic. As an innovation in research, I analyzed not only statistical data at the republican level, but also data on gross municipal product (GMP), mining production, finance, etc., at the municipal level, which was obtained through the collaborations with researchers, including those at North-Eastern Federal University (NEFU) in Yakutsk. Another example is joint research with Sakha researchers on forest fires in Sakha, which was conducted by Daiju Narita, one of the members of our sub-program (Narita et al. 2021a; 2021b). The authors argued that the recent increase in forest fires in Sakha was not only a result of climate conditions, but also of socioeconomic changes and policy failures associated with the forest management system in Russia.

Influence of Russia's invasion of Ukraine on our project

Russia's invasion of Ukraine occurred just when it looked like we would finally be able to travel abroad from around the Summer of 2022. Two years have already passed since then, but, needless to say, the last two years have had a greater impact on our project than the two years of the coronavirus pandemic.

First, Russia's invasion of Ukraine left many of us who are Russian area studies researchers with a sense of loss. If some credible researchers had predicted such an act of Russian aggression before 2022, it was hard for many of us, at least myself, to believe that Russia would do something like this in a situation where relations, including economic ties, had become so close between Russia and the West during the 30 years after the end of the Cold War. Looking back, perhaps we should have been more aware of the dangers posed by Russia when it annexed Crimea in 2014. But, since Crimea's historical background and residents' awareness of Russia seemed different from that of the other regions of the former Soviet Union or Ukraine, I wondered if we could accept annexation. When Russia launched its military invasion in February 2022, there was a strong shock from witnessing the actuality that Russia would really do something like this. I held the idea that closer economic relations between the two countries would increase people-to-people exchanges between the two countries, which is by no means a bad thing for the development of various relations between them. Such a naive idea was betrayed.

Second, under such circumstances, what we researchers of the Russian economy were required to do was to analyze the impact of the economic sanctions imposed on Russia by the West. At the Slavic-Eurasian Research Center (SRC) where I worked, we published an urgent appeal on our website on 25 February 2022 stating that we firmly oppose Russia's invasion of Ukraine. On 3 March, a seminar on "Economic Sanctions and Russia: The Tense Situation in Ukraine" was held online, where I presented a report titled "The Impact of Sanctions on the Russian Economy" (in Japanese). In 2022, I made such reports more than 10 times in various formats.

My conclusion regarding the impact of sanctions on the Russian economy is that, if sanctions were to prohibit the West from importing oil and gas from Russia, its impact on the Russian economy would be quite severe. In reality, their imports from Russia did not decrease much during 2022, and Russia's export earnings and tax revenues from oil and gas increased significantly due to their abnormally high prices.

This issue of Russian oil and gas exports has a major impact on our Arctic research. Until February 2022, development of the Russian Arctic regions had been centered on oil and gas and the Northern Sea Route (NSR). The West was also actively involved in this.[3] However, Russia's invasion of Ukraine and the corresponding economic sanctions imposed by Western countries fundamentally overturned this development strategy. If the Russian economy is separated from the Western world and the West stops importing oil and gas from Russia, the necessity and possibility of developing oil and gas in the Arctic is thought to be greatly reduced.

As mentioned above, our sub-program examines the impact of Russia's resource development in the Arctic on the regional economy, and the progress of resource development was a premise for this research. Therefore, we decided to conduct a full-scale study on the impact of Russia's invasion of Ukraine on resource development in the Arctic. The result of this study will be described in the next section.

Third, after Russia's invasion of Ukraine, Japan's Ministry of Foreign Affairs issued a recommendation to cancel travel to Russia, which closed off the possibility of conducting on-site research in Russia, even though the travel ban due to the coronavirus had been lifted. We were trying to continue our research on the economic situation in Russia's Arctic region even under these circumstances, but just like during Covid-19, how to obtain data became a major issue. The solution was the same as during the pandemic: deepening collaboration with Russian research collaborators. In fact, there was no other way to obtain data and materials, and, without them, it would have been impossible to proceed with the research. Fortunately, in Japan, although it became virtually impossible to travel to Russia, there were no restrictions placed on

3 In this chapter, the West means "unfriendly countries" as defined in Government Resolution No. 313 of 9 March 2022, including Australia, Albania, Andorra, Bahamas, UK, EU, Iceland, Canada, Liechtenstein, Micronesia, Monaco, New Zealand, Norway, South Korea, San Marino, North Macedonia, Singapore, USA, Taiwan, Ukraine, Montenegro, Switzerland, and Japan. The non-West includes all other countries.

inviting Russians to Japan. For example, while Hokkaido University stopped organizational exchanges with Russian universities immediately after Russia's invasion of Ukraine, after many Russian university presidents signed a letter in support of the war on 4 March 2022,[4] the university continues to accept international students and researchers from Russia using the money from MEXT. In Japan, some believe such interactions with Russians should be banned entirely. However, we know that many Russians with whom we continue to interact do not support this war, and some even signed a petition against the war immediately after it began. Although this is not confirmed by data, I believe that many Russians do not support this war (at least not actively) (see Allemann, *this volume – eds.*). Exchanges with Russian researchers after 2022, such as at international symposia and workshops, are detailed below.

Fourth, as we were unable to conduct field research in Russia, and as area studies researchers hungry for such research, we decided to conduct field research in the Arctic region outside of Russia. Since our theme is the impact of resource development on local economies, we visited regions where resource development is underway, including Northern Norway in September 2022 and Alaska in August-September 2023. While visiting the Arctic regions of countries other than Russia, we naturally became aware of the issue of comparing these Arctic regions. In fact, without Russia's invasion of Ukraine, we Russian-focused researchers would not have conducted field research in Northern Norway or Alaska, so this is one of the major changes caused by the invasion. These visits will be detailed below.

Influence of the war on Russia's arctic regions

In our project, we, including Daisuke Harada from the Japan Organization for Metals and Energy Security (JOGMEC), have analyzed how oil and gas development is progressing in the Russian Arctic. There were several reasons why Russia aggressively pursued oil and gas there. First of all, production growth from existing oil and gas fields has reached a plateau, forcing Russia's oil and gas companies to proceed with the development of new oil and gas fields. If we look back at the history of oil and gas development in the Soviet Union and Russia, we can see that development proceeded from west to east and from south to north. Naturally, oil and gas run out if they continue to mine for a certain period of time, so it was reasonable to constantly develop new sources of oil and gas. The Arctic region was considered Russia's final frontier (Tynkkynen et al. 2018). What was particularly advantageous for Russia was the progress of global warming since the beginning of the 21st century. This has made development of the Arctic regions comparatively easier than before, and, most importantly, the increasingly ice-free condition of NSR has made it possible to transport materials and equipment for development and extracted oil and gas (Motomura 2018).

4 https://rsr-online.ru/news/2022/3/4/obrashenie-rossijskogo-soyuza-rektorov/

Tabata (2019) analyzed how important the Arctic regions have become for Russia's finances. These regions receive large subsidies from the federal budget because of the high cost of public services due to their cold climate and limited transportation means. However, tax revenues from oil and gas in areas such as Yamal-Nenets AO, located in the Arctic, have been shown to far exceed these subsidies. This is the reason why the Russian government places emphasis on Arctic development centered on oil and gas, a point also stressed in Tynkkynen (2021).

On the other hand, in 2021 the COP26 in Glasgow served as a major trigger for the movement towards decarbonization, which has gained momentum around the world. We believe that if this really progresses, the global demand for oil and gas will shrink, which will have a major impact on Russia's development of the Arctic regions.[5] Although the decline in demand for oil and gas is a negative factor for Russia, it has also been shown that Russia has advantages in terms of decarbonization, such as hydrogen production, in addition to carbon absorption by forests and underground storage of carbon dioxide (Harada 2022).

It was under such circumstances that Russia invaded Ukraine. For Russia, oil and gas revenues are the cornerstone of tax revenues, so the central issue in the debate over economic sanctions was what to do about oil and gas imports from Russia. It was clear that if Russia could no longer export oil and gas it would be a major negative factor for Russia's development of the Arctic regions. However, in 2022, as the West reduced oil and gas imports from Russia, their prices soared, and the value of Russia's oil and gas exports increased by 30.6% and 80.5% respectively, from the previous year, causing the federal budget's oil and gas revenues to also increase by 27.9%.[6]

We particularly focused on the plan of development of the NSR until 2035, approved by Government Order No. 2115 of 1 August 2022 (Mikhailova and Tabata 2024). This plan replaced the "NSR infrastructure development plan until 2035" adopted by Government Order No. 3120 of 21 December 2019. The video meeting on Arctic development issues held on 13 April 2022, presided over by President Putin, is extremely important in considering Russia's Arctic policy from February 2022 onwards.[7] It should be noted that this was held less than two months after the invasion, indicating Putin's emphasis on development of the Arctic. At the meeting, Putin first stressed the social sphere, displaying his stance of supporting the people of the Arctic regions under sanctions. In particular, the government was instructed to formulate a law on northern supply (*severnyi zavoz*) that would include the designation of a responsible organization for the transport of food, medicine, fuel, etc., to northern regions in preparation for the winter. At the conclusion of the meeting, Putin requested that the government draw up a new NSR development plan.

5 The simulation model created to consider the impact of decarbonization on the Russian economy later became useful when considering the impact of economic sanctions.

6 Calculated from FTS (2022; 2023) and the Russian Ministry of Finance's website.

7 http://kremlin.ru/d/68188.

By precisely analyzing the target volumes of the new NSR plan and the oil and gas projects behind these targets, Mikhailova and Tabata (2024) concluded that achieving the ambitious goals of the plan is unlikely. The main reasons are a decrease in demand for Russian oil and gas in the West, a ban by the West on the supply of equipment and high technologies for the energy industry to Russia, and insufficient shipbuilding capacity in Russia. We predict that the NSR is likely to be used primarily as an export route for oil and LNG to China, and as a domestic route for transporting goods to the Russian Arctic regions in the future. However, the Russian government has not so far lowered their high goals for the NSR. Since the reason why it is difficult to achieve the target is economic sanctions imposed by the West, it seems to be impossible for the government to publicly admit this and lower the target.

We also analyzed the economic situation in the Russian Arctic regions after Russia's invasion of Ukraine. It is interesting that Yamal's mining production decreased by 2.3% in 2022 compared to 2021 due to a large decline in natural gas exports to Europe, while Sakha's mining production increased by 11.4% due to expanded exports of oil, gas, and coal to China (*SEP* 2022, No. 12). This trend continued in 2023, with mining production decreasing by 4.5% in Yamal and increasing by 0.5% in Sakha in comparison to the previous year (*SEP* 2023, No. 12).

The contrasting performance of Yamal and Sakha was due to the fact that international oil and gas trading relationships have changed significantly from 2022 onwards. Comparing 2023 to 2021, Russia's crude oil exports increased by 1.2% in quantity. While in 2021, 40% of Russia's crude oil exports were directed eastward and 60% westward, in 2023, this proportion changed to 85% and 15%, respectively. In 2023, Russia's natural gas pipeline exports fell to 49% of 2021.[8] In 2021, the share to Europe was 82%, but by 2023 it fell to 45%.[9] Yamal, the economy of which was supported by gas exports to Europe, has fallen into a difficult situation, while Sakha, which exports oil and gas to China, is thriving.

Masahiro Tokunaga of our sub-program focused on the Arctic LNG-2 project in the Gydan Peninsula, which was the largest LNG project in the Arctic after the Yamal LNG project, and in which Japan was one of the stakeholders. Based on his previous studies on Japan's foreign direct investment in Russia (Tokunaga and Suganuma 2020), he was wondering why Japanese companies made a decision to invest when economic sanctions against Russia were imposed after its annexation of Crimea and what they should do under the present more serious situation (Tokunaga 2023). He is now conducting interviews on this topic with many Japanese and foreign specialists and businesspeople who have been involved with this project.

8 These oil and gas data for 2023 were delivered by Deputy Prime Minister Aleksandr Novak on 6 February 2024. https://neftegaz.ru/news/dekarbonizatsiya/817040-a-novak-vyshel-na-otkrytyy-dialog-v-sovfede-podvedya-itogi-tek-za-2023-g-i-otvetiv-na-aktualnye-vopr/, [accessed 25.02 2024]

9 Calculated from IEA (2024). Europe by IEA's definition includes such countries as Turkey and Belarus, in addition to EU countries.

At a time when the economy of the Russian Arctic regions has been greatly affected by sanctions, it is noteworthy that the Federal Law on state support for business activities in the Arctic zone of the Russian Federation was revised on 23 March 2024, which added two districts (*raions*) of the Khanty-Mansi AO to the Arctic zone. Previously, the Arctic zone included the entire territories of Murmansk Oblast, Nenets AO, Yamal-Nenets AO, and Chukotka AO, and part of Karelia Republic, Arkhangelsk Oblast, Komi Republic, Krasnoyarsk Krai, and Sakha Republic. Khanty-Mansi AO is the center of crude oil production, accounting for 47.2% of Russia's crude oil production in 2022.[10] This decision seemed to be due to strong pressure from Novatek, which acquired mining licenses in the two districts of the Khanty-Mansi AO and wanted to enjoy preferential taxes applied to the Arctic regions (information from Daisuke Harada). This episode demonstrates the intention of Russia's oil companies to continue crude oil drilling in the Far North under the present difficult situation.

Exchanges with Russian researchers

As we discuss below, we have been working closely with Sakha researchers on our project even after Russia's invasion of Ukraine. It should be emphasized that these relationships did not begin recently. In the field of the natural sciences, research on permafrost and other topics has been conducted in Sakha by Japanese researchers since the 1990s. Since 2015 a project entitled "C Budget of Ecosystems and Cities and Villages on Permafrost in Eastern Russian Arctic (COPERA)" has been implemented as a Belmont Forum- and Russian Foundation for Basic Research-funded project. Atsuko Sugimoto of Hokkaido University led this project and together with local communities in the Sakha Republic created a permafrost, hydrological, and meteorological observing network to estimate CO_2 sequestration by the permafrost ecosystem (tundra and taiga) and CO_2 emission in cities and villages.

In the field of cultural anthropology, many researchers, including Hiroki Takakura of Tohoku University and Shiro Sasaki of the National Ainu Museum, have conducted field studies in Sakha and collaborated with local researchers to advance their research. In the ArCS project, joint research was conducted with local researchers mainly by Takakura from the Japanese side. Crate et al. (2017) was one of the results of such collaborations: it depicts the interaction between climate change and social culture in East Siberia through the fusion of humanities and natural sciences. As part of joint research activities of ArCS in Sakha, a textbook was published in Russian that provides clear explanations of the impact of climate change on Sakha (Takakura et al. 2019).

10 Calculated from https://rosstat.gov.ru/storage/mediabank/prom-december_2022.xlsx and https://72.rosstat.gov.ru/storage/mediabank/3%20%D0%9F%D1%80%D0%BE%D0%B8%D0%B7%D0%B2%D0%BE%D0%B4%D1%81%D1%82%D0%B2%D0%BE_%D0%A5%D0%9C%D0%90%D0%9E_22.xlsx (accessed 15 February 2024).

Along with such research cooperation, educational cooperation also progressed between Hokkaido University and NEFU. An educational exchange program run by Hokkaido University with five universities in the Russian Far East (NEFU in Yakutsk, Sakhalin State University, Far Eastern Federal University in Vladivostok, Pacific National University in Khabarovsk, and Irkutsk State University) started in 2015 with funding from MEXT. Every year, five graduate students from each Russian university participate in a summer school at Hokkaido University, and two of them stay for half a year, attending classes and seminars. Graduate students from Hokkaido University were also sent to these Russian universities. Regarding NEFU, Atsuko Sugimoto held a summer school there, and there were particularly close exchanges involving faculty members.

Based on these research and educational exchanges, collaboration with Sakha researchers has continued and strengthened within ArCS II. For our sub-program, we have invited many researchers from Russia even after Russia's invasion of Ukraine. In particular, an international symposium in December 2022 and an international workshop in January 2024 are noteworthy as events that included several Sakha researchers.

Fig. 1 A scene from the discussion at the symposium, 2022.

The international symposium was held from 14–16 December 2022 as one of the regular international symposiums held twice a year by the SRC. Its topic was "Above the Permafrost: How Climate Change and Resource Development Are Changing Local Life in the Arctic." This was the first time in three years that the SRC's international symposium was held exclusively in person. A total of 11 people were invited from abroad, including three each from Finland, the United States, and Russia.

Including domestic participants, the total number of participants was 58. The social gathering at Hotel Mystays Sapporo Aspen and the excursion to Upopoy, the National Ainu Museum, were run as scheduled, so that we could hold the event in a format that closely resembles the international symposium before the coronavirus pandemic.

Because ArCS II involves interdisciplinary research, unlike SRC's usual international symposiums, many natural science researchers participated. In each session, discussions included changes in permafrost, the livelihoods and other economic activities of Indigenous peoples, including the Sakha people, who live and operate on it. The culture and identity of Indigenous peoples, and the possibility of their sustainable development were also considered. Out of a total of 19 reports, 10 were related to the Sakha Republic. This is because much of the Arctic region research that has been conducted as part of ArCS II's social and cultural issues has been based on field research in the Republic and on data obtained from the Republic. One of the speakers of the symposium and one of the members of our sub-program, Kazuho Yokogawa, later published a paper in *Polar Science* on the public budget performance of Sakha (Yokogawa 2024). As was the case of Tabata (2021), she analyzed not only the republican budget, but also the municipal budgets of the Sakha Republic (Fig. 2).

The Arctic research workshop "Changing Russian Arctic: The Case of Sakha" was held on 16 January 2024, and included Russian researchers from Sakha and other countries. In addition to two researchers from Yakutsk and one from Paris (who is originally from Yakutsk), we also invited a researcher from the Institute of Geography, RAS in Moscow, currently staying at Doshisha University in Kyoto, and a graduate student from Yakutsk studying at Tohoku University in Sendai. Since one researcher from Yakutsk was staying at the SRC, a total of six Russian citizens gave reports. A researcher from Moscow also reported on Sakha's population. From the Japanese side, SRC's Tabata and Hattori presented reports entitled "A Note on the Structural Changes in the Sakha Economy" and "Possible Impacts of Western Sanctions on Sakha Diamond Industry," respectively. All eight reports basically concerned the Sakha economy. Figure 3 is derived from Tabata's presentation and is shown here to demonstrate how deeply we are investigating the Sakha economy.

The main reason for planning such a workshop specialized in Sakha is that we have very close research collaboration with Sakha researchers. This was also influenced by the decision to compile the book entitled *Changes in the Russian Arctic Economy: A Case Study of the Sakha Republic* in Japanese. Our sub-program was originally intended to focus on Sakha and Yamal, but ended up giving more emphasis to Sakha. This was largely due to the fact that we were able to work closely with Sakha researchers. I am convinced that, amid the coronavirus pandemic and Russia's invasion of Ukraine, research could not have progressed without this kind of trust and cooperation between researchers. In addition, it should be noted that since in Sakha, oil and gas production are increasing rapidly now, we can observe its impact on regional and local economies.

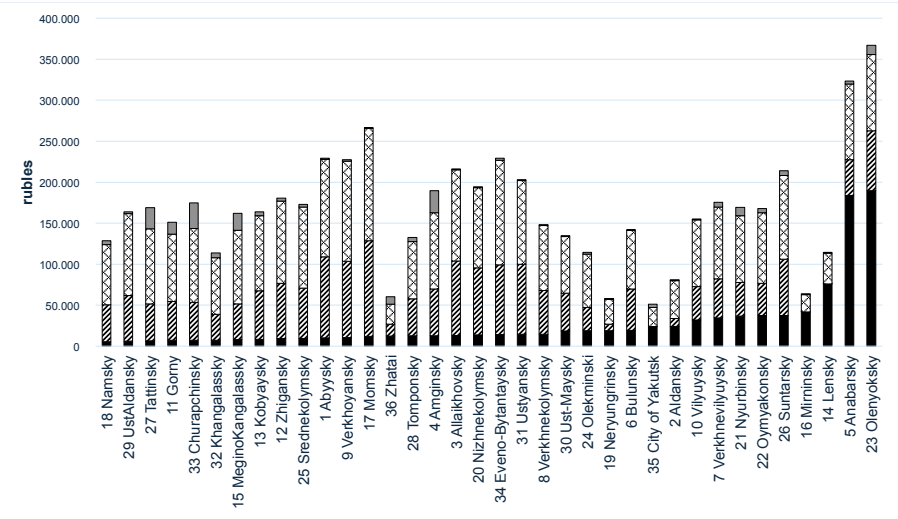

Fig. 2 Revenue composition per capita in the Sakha Republic's districts in 2019.
Note: Districts are listed from left to right in increasing order of tax and non-tax revenues. From bottom up: *Revenue without transfers, Equalizing grant* (*Dotatsiia*), *Subventions, Subsidies*. Numbers in front of *ulus* names correspond to those in Figure 3.

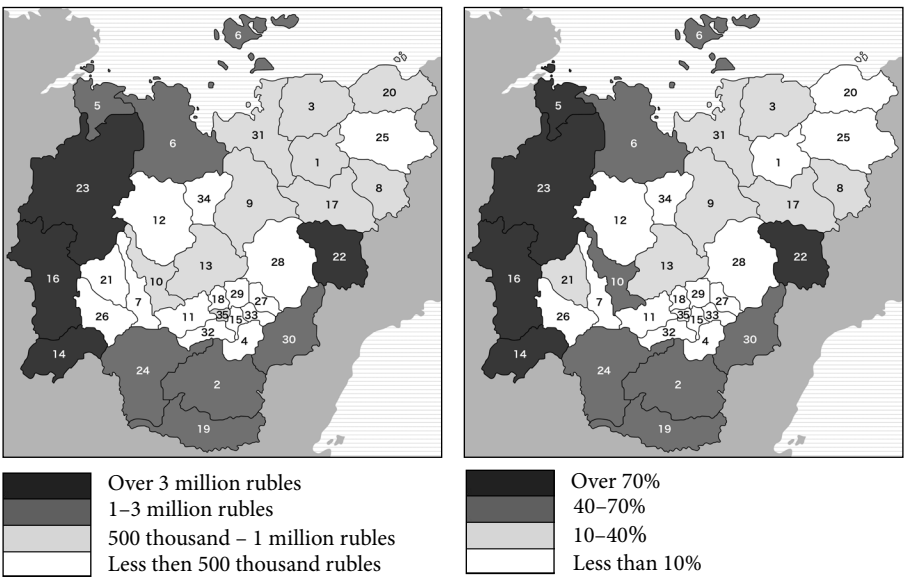

Fig. 3 Per capita GMP (left) and the share of the mining industry in GMP (right) of Sakha in 2021. Sources: Compiled by the author from data obtained from the website and other materials of the Sakha statistical organization.

At the workshop, many detailed questions were asked, making it a very meaningful event. In conjunction with this workshop, some members of our sub-program came to Sapporo from elsewhere in Japan, to have individual meetings with Sakha researchers regarding future collaboration.

Visits to the Arctic regions outside of Russia: Opening new doors

Before the project began, we had planned to conduct a field survey every year in a resource development area in the Russian Arctic regions, but, due to Russia's invasion of Ukraine, we were unable to do it. Thus, we decided to conduct a field survey in other countries. In September 2022, we carried out a field survey in Tromsø and Hammerfest (about 230 km northeast of Tromsø). Both regions are at a higher latitude than Murmansk, with Hammerfest located 70°N. We owed much to Dr. Aileen Espíritu of the University of Tromsø (UiT) for arranging meetings and other visits in Northern Norway.

We first visited Tromsø: UiT, its museum, the Arctic Council Secretariat, and the Arctic Economic Council. This was a good opportunity for us Japanese researchers of the Russian Arctic to talk with Norwegian researchers and staff of international organizations about various issues related to Arctic development after Russia's war against Ukraine. We learned how the Arctic Council and the Arctic Economic Council tried to respond to the new geopolitical situation. We also obtained new information regarding the Sami people's lives and changes to these in Norway.

Fig. 4 Hammerfest town, 2022.

Hammerfest hosts Norway's largest gas field (Snøhvit), located 150 km offshore and has the LNG facility to process gas transported via an underwater pipeline. Most of Norway's electricity production comes from hydroelectric power, and most of the LNG and crude oil extracted off the coast of the country are exported to Europe. In Hammerfest, LNG production began in 2007 and is predicted to expand further. During our stay at Hammerfest for about three days, the city officials and businesspeople we met all talked about the benefits of LNG production. We heard that property taxes and donations paid by LNG companies are being used to build new hospitals, add night lighting to educational facilities, and start a number of new projects related to decarbonization. While the war in Ukraine has dampened economic discussions in all countries, for the first time in a while we were able to hear many stories about a bright future. It should be noted, however, that the increase in demand for Norwegian LNG was caused by Russia's invasion of Ukraine.

In 2023, we visited Alaska. Five members of our sub-program conducted research on oil and gas development and its impact on the local economy and society in Anchorage and the North Slope, Alaska from 28 August to 6 September 2023. In Alaska, crude oil has been extracted in Prudhoe Bay (North Slope Borough) on the coast of the Arctic Ocean (Beaufort Sea) since the 1970s; it is transported via a pipeline across Alaska, then exported from ports in the state's south. There are currently discussions about projects to export natural gas produced on North Slope either by pipeline, like crude oil, or by tanker from the Arctic Ocean, like Russia's Yamal LNG. In both proposals, Asia is envisioned as the destination for exports, and as international oil and gas trading relationships have undergone major changes starting in 2022, there is a sense of great expectation for a market in Japan.

In Alaska, under the Alaska Native Claims Settlement Act (ANCSA) of 1971, Native American title to land was extinguished, and regional corporations were established in each region and village corporations were created in each Indigenous village. Through these corporations, Indigenous peoples were able to enjoy rights and benefits over land and underground resources. All regional corporations and many village corporations are commercial (for-profit) entities, and oil companies operate under contracts with these corporations.

The state of Alaska is vast, and its North Slope Borough includes the federally owned National Petroleum Reserve in Alaska (NPRA) and the Arctic National Wildlife Refuge (ANWR), which was established for nature conservation. The Arctic Slope Regional Corporation (ASRC), one of the regional corporations, owns part of the area between these two zones and is proceeding with development. At NPRA, during our visit, news broke that the Biden administration would cancel oil and gas drilling leases that had been approved under the Trump administration. We learned that the debate surrounding resource development and nature preservation still continues. However, due to the ANCSA system of incorporating Indigenous peoples into commercial organizations, we noticed by this visit that they are less likely to oppose

Fig. 5 In front of an oil drilling facility on the coast of the Beaufort Sea, 2023.

Fig. 6 Caribou in the pipeline network in North Slope, Alaska, 2023.

resource development and advocate for nature conservation than is the case in some other Arctic regions.

Before going to North Slope, we attended the Alaska Oil and Gas Association's annual meeting held over two days in Anchorage. This meeting, held at the city's largest convention center, was attended by approximately 300 people, including oil and gas industry officials and state government officials. We were able to efficiently collect information on the current situation of oil and gas development in Alaska. In Anchorage, we also spoke with experts in industries such as fishing, as well as executives from the Alaska Federation of Natives.

The visit to North Slope was arranged by Qilak LNG CEO Mead Treadwell,[11] who himself led the visit. Over the course of two days, we visited several mining areas, including facilities where crude oil drilling is being carried out, and a methane hydrate development and testing site where JOGMEC is also participating. We were able to enter and inspect places that we would normally not be able to access. We were struck by the sight of these production facilities in the vast Arctic nature that stretches as far as the eye can see.

Through this field survey, we were able to clearly understand the following three characteristics of Alaska compared to places such as the Russian Arctic. First, Alaska has vast mineral resources, including oil, gas, coal, and rare metals, and the potential for their development is extremely high. We have the impression that development is being carried out very carefully, taking into consideration nature conservation, etc.; this may mean that so-called overexploitation has been prevented, and that there are still many resources left. Not only are the natural conditions harsh, but development regulations for nature conservation are also strict, which may mean that development is not undertaken unless it is expected to be profitable. The biggest challenge for any resource is how to transport it, a challenge much exacerbated by Arctic conditions.

Second, there seems almost no conflict with Indigenous peoples regarding resource development. The abovementioned mechanism (ANCSA) for incorporating Native Americans into commercial organizations, also known as the Alaska corporate model, has contributed to this. Compared to countries such as Russia, Indigenous people in Alaska seem to be enjoying far more benefits from development in various aspects such as employment and income.

Third, due to their geographical proximity, it has become clear that Alaska faces Japan and Russia. There seems to be a strong awareness of trends in Russia as a supplier country and Japan as a demand country, not only for oil and gas, but also for fisheries and forestry. In other words, we realized that Japan has strong ties not only with Russia, which is located in the Arctic, but also with Alaska as a source of resources.

After these visits to Norway and Alaska, we have become much more inclined to compare the Arctic regions. At the same time, the Japan Consortium for Arctic

11 Former Lieutenant Governor of Alaska (2010–2014).

Environmental Research (JCAR) jointly conducted a survey of Arctic research in Japan and compiled the results into a book, titled *Arctic Research: Its Current Status and Future Plans* as part of a project to consider long-term plans for Arctic research in Japan (JCAR 2024). Many of our members were involved in writing and reviewing this work, including overseeing the economic section, which was divided into macro-economies and major industries; household finances, lifestyles, and economic disparities; and environmental changes. As we were required to cover not only the Russian Arctic regions, but the entire Arctic regions, we tried to write by comparing Russia with Northern Europe and North America. In particular, we referred to Glomsrød et al. (2020), Coates and Holroyd (2020), and Larsen and Fondahl (2014) in making comparison. Our book was published in March 2024.

Conclusion

This chapter describes how a research project conducted in Japan on Russia's resource development of the Arctic regions and its impact on the regional economy has progressed amidst the major changes in the world situation caused by Russia's invasion of Ukraine. Because our research theme is related to oil and gas, Russia's most important resources, and because oil and gas are the focus of economic sanctions against Russia, the research theme itself has been greatly challenged by Russia's invasion of Ukraine. The structure in which Russia was exporting large amounts of oil and gas to the West and actively promoting oil and gas development in the Arctic regions together with the West has completely collapsed. However, Russia continues to supply oil and gas to the non-West and has indicated a willingness to continue its development in the Arctic.

Under these circumstances, we will continue to conduct research on oil and gas development in the Russian Arctic and to consider its impact on the regional economy and society. I believe that the need for such research has not diminished from the perspective of environmental conservation in the Arctic. Furthermore, as there is a movement to actively promote oil and gas development in the Arctic regions of Northern Europe and North America to replace supply from Russia, I think that it is also important to pay due attention to the Arctic regions outside Russia.

If Russia had not invaded Ukraine, the global decarbonization movement that rapidly gained momentum in 2021 might have accelerated, but it feels like it has receded since 2022. On the other hand, there are moves to further decarbonize in order to break away from dependence on oil and gas from Russia, and we believe that it is necessary to follow up on such moves.

Major disadvantages to the Arctic oil and gas industry of the severing of relations between Russia and the West and the elimination of Western companies' involvement in Russia's development of the Arctic are that Russia's development technology

will deteriorate and consideration for the environment will be neglected. Up until now, Russia has had problems in terms of consideration for the environment and the Indigenous people living there when compared to Northern Europe and North America, and there is a possibility that more serious problems will arise in the future.

Our cooperative relationship with Russian researchers, including those from Sakha, is a great asset to our research. Our interaction with them did not begin after the start of our project, but has continued for 20–30 years. I think this relationship will continue to be important. While it is not possible to carry out field surveys in Russia now, it is essential for our research to incorporate our Russian colleagues' research into our own and to share data and analysis results. I do not know when this will happen again, but I believe it will be of great help when rebuilding relations with Russia after this war ends.

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Figures