

SIGNIFICANCE OF POLAR RESEARCH FOR SVALBARD'S ECONOMY

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Abstract: The aim of the following paper is to present ongoing changes in Svalbard's economy and to emphasize influence of scientific research for specific economic structure of the archipelago. To start with, author briefly describes main periods in history of this area, though the main focus is on present situation, so downturn of coal mining along with growing presence of scientists, development of University Centre in Svalbard and popularization of polar tourism. Thanks to combining quantitative methods, as well as direct observation and interviews with inhabitants during author's stay in Svalbard in summer 2015, the paper answers the research question how does polar research influences Svalbard's economy.

Keywords: Svalbard, Spitsbergen, economy of Svalbard, polar research in Svalbard, University Centre in Svalbard, coal industry in Svalbard

INTRODUCTION

The archipelago of Svalbard comprises of Spitsbergen, Nordaustlandet, Barentsøya, Edgeøya, Kong Karls Land, Hopen, Prins Karls Forland, Bjørnøya and all the other islands, rocks and shears between 74° and 81° northern latitude and 10° and 35° eastern longitude. Main permanent settlements are Longyearbyen, Barentsburg, Ny-Ålesund and Sveagruva. In addition to these, there are also smaller research stations and meteorological stations in Hornsund, on Hopen and on Bjørnøya. The name 'Svalbard' means 'the land with the cold coast' or 'cold edge'. Up until the 20th century Svalbard was considered *terra nullis* by many nations. Since the 17th century, people from Norway, Russia, Sweden, the Netherlands and other countries have been active in Svalbard within fields such as whaling, fishing, research, mining and tourism, yet there was not one set legislation nor governance framework over this land. After I World War during Versailles negotiations treaty – called later on the Svalbard Treaty – was signed

on 9 February 1920, though it only came into effect with the Svalbard Act, on 14 August 1925.¹ The treaty provides for Norwegian sovereignty over Svalbard, while at the same time providing for certain rights for the other signatories. It is Norway that ratifies and enforces the legislation in the area. Nevertheless, the treaty does include some conditions restricting the enactment of Norwegian sovereignty, and authorities are required to see if legislation and administration respect conditions such as non-discrimination, taxation, military restrictions and environment conservation.² Most important factor that led to enforce a treaty over this territory was a boom in mining industry that resulted in extensive extraction and then land owning problems appeared. Recently, one can observe a major shift in economic activities in Svalbard— decreasing influence of coal mining while research and tourism becoming main revenue sources.

The aim of the following article is to discuss changes in Svalbard's economy and emphasize the influence of research in this area for specific economic structure of the archipelago. By combining quantitative methods, statistics and reports analysis as well as direct observation and interviews with inhabitants during author's stay in Svalbard in summer 2015, the paper answers the research question how does polar research influences Svalbard's economy. Author positively verifies 3 hypotheses: (1) along with decreasing employment in mining industry, role of other sectors, such as research and tourism increases, (2) role of research in Svalbard and its impact on economy has developed significantly in the last twenty years, (3) growth in research sector resulted in minimizing employment gap created due to reducing shares of mining industry.

HISTORIC BACKGROUND OF SVALBARD DEVELOPMENT

Looking at the archipelago from a historic perspective, author decided to introduce division into four main periods of Svalbard's history. First one defined as **hunting period**, started with Barents' discovery of Spitsbergen in 1596. Along with his discovery, information about resource abundance, especially seals and whales, in the region started to spread. Since 17th century whalers from Netherlands, Britain and other countries started their hunts around the archipelago.³ After a time, they turn to be so intense that animal populations were severely reduced and commercial hunting ceased due to lack of economical motivation. Coursing activities moved from the sea to the land where Russian trappers (wintered be-

¹ *Treaty between Norway, The United States of America, Denmark, France, Italy, Japan, the Netherlands, Great Britain and Ireland and the British overseas Dominions and Sweden concerning Spitsbergen signed in Paris 9th February 1920*, available on-line: http://syssemmannen.no/Documents/Syssemmannen_dok/English/Legacy/The_Svalbard_Treaty_9ssFy.pdf (18/10/2016).

² *Ibidem*.

³ J. Szupryczyński, *Druga wojna światowa na Svalbardzie*, „Przegląd Geograficzny” 2011, tom 83, nr 4, s. 483–506.

tween 1715 and 1850) followed by Norwegians (at the end of 18th century) hunted polar bears, reindeers and arctic foxes. Along with trappers presence in Svalbard the academic interest about the region started to grow. Scientific research in Svalbard started in 19th century opening **period of exploration**. Before that, data was collected by trappers and hunters or even tourists, yet there were no specific scientific expeditions. In 1827 the archipelago was explored by an expedition led by geologist B.M. Keilhau.⁴ Doubtless, the biggest achievements at those times in exploring fall for Swedes. During all of their expeditions, geological research were carried out. At the same time many nations was involved in research such as Russians, Norwegians, Germans, Austrians, or British. Norwegians were the one who started large scale geological and also topographical activities. In 1920s Ny-Ålesund become a starting point of Roald Amundsen's and Umberto Nobile's North Pole expeditions. At the beginning of 20th century, boom of commercial mining started the third **period of extracting**. In 1906 American businessmen John M. Longyear acquired mining rights from a Norwegian company and The Arctic Coal Company was settled along with Longyear City (*norw. Longyearbyen*).⁵ Ten years later Norwegian Store Norske Spitsbergen Kulkopmani AS took over mining industry in Longyearbyen developing new mining sites and increasing the extraction. II World War was a turbulent times for the archipelago. After German attack on Soviet Union in 1941 whole population of Svalbard was evacuated either to USSR or UK. In 1943 Nazi Germans raided Svalbard.⁶ Reconstruction of local community started in 1948. After the war Svalbard stopped being so extremely isolated. Since 1975 civil airport started to operate in Longyearbyen giving better accessibility to the archipelago. Three years later phone network via satellite was connected and in 1984 archipelago received direct TV broadcast from Norwegian state television (NRK). Due to lowering prices of coal on global market as well as rising cost of extraction, since 1990s one can observe development in new fields such as **research and tourism**. In 1993, University Center in Longyearbyen was established, in 2002 Svalbard Environment Protection Act has come to power enforcing preservation of a virtually untouched environment in Svalbard with respect to continuous areas of wilderness, landscape, flora, fauna and cultural heritage⁷ that was absolutely necessary in the view of growing number of visitors and number of academic projects.

⁴ J. E. Kristiansen, *This is Svalbard*, Statistisk sentralbyrå 2014, available on-line: [https://www.ssb.no/a/histstat/svalbard/this-is-svalbard2014.pdf_\(10.10.2016\)](https://www.ssb.no/a/histstat/svalbard/this-is-svalbard2014.pdf_(10.10.2016)).

⁵ P.K. Reymert, *Ny-Ålesund – the world's northernmost mining town*, 2013, available on-line: [http://www.sysselmannen.no/Documents/Sysselmannen_dok/Trykksaker/NY_Aalesund_hefte_ENG_oppslag.pdf_\(11.10.2016\)](http://www.sysselmannen.no/Documents/Sysselmannen_dok/Trykksaker/NY_Aalesund_hefte_ENG_oppslag.pdf_(11.10.2016)).

⁶ J. Szupryczyński, *op. cit.*

⁷ *Svalbard Environment Protection Act. Act of 15 June 2001 No.79 Relating to the Protection of the Environment in Svalbard*, Oslo 2001, available on-line: [https://www.regjeringen.no/en/dokumenter/svalbard-environmental-protection-act/id173945/\(12.10.2016\)](https://www.regjeringen.no/en/dokumenter/svalbard-environmental-protection-act/id173945/(12.10.2016)).

ECONOMIC BACKGROUND OF SVALBARD ARCHIPELAGO

Population of Svalbard oscillates between 2,600 people with almost 60% of Norwegians and 40% Russians. More people resident on Svalbard during summer months than in the winter and they are mainly concentrated in 2 settlements: Norwegian – Longyearbeyn and Russian Barentsburg. Also, there is around 30 permanent residents in Ny-Ålesund. As figure 1 shown in the early 1980 number of residents (so the one that stay longer than 6 months) was the highest with Russian prevalence. Situation started to change in late 1990s when Russian settlement become abandoned (such as Pyramiden) and growing number of residents, also foreign, settled down in Norwegian towns.

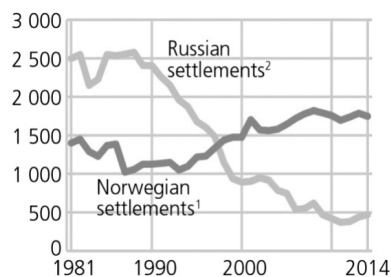


Figure 1. Changes in number of Norwegian and Russian residents in Svalbard between 1981–2014

Source: J.E. Kristiansen, *This is Svalbard 2014. What the figures say*, 2014.

There has always been dominance of men among Svalbard residents, mostly due to the coal mining related jobs. Even today 64% of population is men. Population of the archipelago is a young one – majority falls into 25–44 year old group with almost total absence of people over 70. That is caused due to the fact that Svalbard is seen a place to work. Over 85% people are employed. Although up to 25% works only seasonally. It is a popular destination for people who want to earn more and pay lower taxes. Over 50% of households are single person, only 14% contains 4 or more people.

For almost a century coal mining was a dominant economic activity. Until 1990s Longyearbyen was a *company town*, a community in which Store Norske was behind most of the everyday amenities.⁸ Company ran only shop and until 1980 there was no money in circulation, only special tokens issued by Store Norske. Only in 1990s emphasize on diversification of the sectors has started along with Norwegian Parliament Report no. 50 (1990–1991), where Parliament advised to diversify commercial activity due to downturn in coal mining industry. Government noticed that lowering prices of the coal and rising cost of its exploration will result in closing mines and that would led into job reduction in

⁸ J. E. Kristiansen, *op. cit.*

the dominant sector. It promoted and subsidized other sectors, with using natural advantages of geographical location, to provide switch in the economy. One of the main objectives of Svalbard policy is to maintain Norwegian communities in the archipelago.⁹ Long term planned action brought benefits not only from economic perspectives but to the well-being of whole community of Svalbard. Also, it brought major shift in employment – in last decade there has been a substantial grow in research, tourism and private sector grew to 44% in 2015 (fig.2)

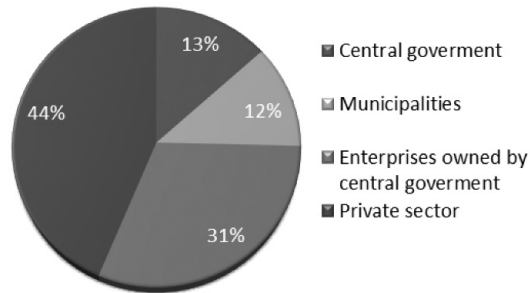


Figure 2. Employment in Svalbard 2015

Source: Own elaboration based on Statistics Norway.

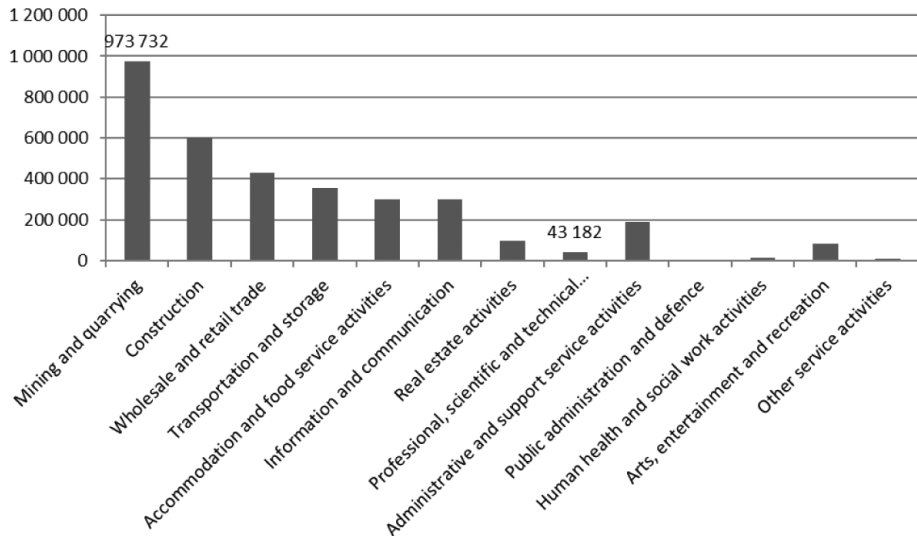


Figure 3. Industry turnover in 2014 [in NOK]

Source: Own elaboration based on Statistics Norway.

⁹ A. Grydehøj, *Informal diplomacy in Norway's Svalbard policy: the intersection of local community development and Arctic international relations*, "Global Change, Peace & Security" 2014, vol. 26, no 1, p. 41–54.

In 1907 1,500 tons of coal were extracted in 2007 it was over 4 million tons. After global crisis, industry started to drop with less than 2 million tons in 2010. Mining is still the biggest sector with revenues is 27% of total industry turnover in 2014, tourism hold 11%, research close to 1,5%.n Situation is rapidly changing though after closing Svea site in 2015, share of mining fell below 20%, yet tourism grows to 12% and research over 3%.

SCIENTIFIC ACTIVITIES ON SVALBARD

Research has always been an integral part of Svalbard. Thanks to unique environmental conditions and natural opportunities, professional observations were conducted since 19th century. Development in natural sciences resulted in growing interest in polar regions. Year 1827 is seen as a start of research in Svalbard along with expedition of B.M. Keilhau – geologist from Christiania (Oslo) University. Although that expedition was prelude to full academic ones, it was so significant since it was first, semi-professional one with academic staff instead of only gathering data during other activities such as hunting or traveling. In 1878 an expedition of Norwegian North Sea drew a chart of Adventfjorden and is seen as the first fully scientific research in the area.¹⁰ Official Norwegian scientific research began on Svalbard in 1906. Even during II World War Wilhelm Dege gathered meteorological information for German army, that helped better



Figure 4. Main scientific areas in Spitsbergen

Source: <http://www.worldatlas.com/aatlas/infopage/svalbard.htm>.

¹⁰ P.K. Reymert, *op. cit.*

planning military actions, yet was allowed to publish his findings in 1950s. After II world War, Longyearbyen started to restore and further develop as a base for scientist working in Svalbard. The Norwegian Polar Institute was granted a *Viten-skapens Hus* (the house of science), barracks that could be used by scientist as overnight accommodation.¹¹ In 1957 expedition established Polish Polar Station in Horsund. Currently it is the only Polish station in Svalbard where expeditions can winter every year.

Nowadays, role of the Svalbard research is constantly increasing. On one hand, awareness of the polar issues grows along with rapid changes in the Arctic and political interest of this region. On the other, as mentioned above, when Norwegian government decided to diversify industries and research was an obvious choice due to favorable conditions such as long history, existing infrastructure and objectives to study on. Svalbard has become a key area for gathering data on what happens when temperatures in Arctic rise and how it may impact the global climate.¹² Research activities are held mainly in Longyearbyen, Ny-Ålesund and Horsund (fig. 4). In 2014 a thousand of researches from almost 500 institutions representing 30 nations carried out science activities on the archipelago.

One of the most important events for research development was establishing **University Center in Svalbard (UNIS)** in Longyearbyen in 1993. It not only boost educational offerings but increased development of local community of the city. Among many reasons UNIS was created as an alternative to coal mining and tourism industries and need of strengthening Norwegian position in the region. It used unique condition for education and research as well as helped making Norwegian polar research even more advanced. It is owned by Ministry of Education and Research in Norway. In 1995 UNIS campus has been open, causing a great influence on economy thanks to new jobs to build and maintain the Center. University started from 23 students and 7 people of staff.¹³ Number of students grows constantly. In 2007 there were 357 students, in 2015 – 690. They represented 44 nations and participated in 98 offered courses held in 4 departments: (1) Arctic Biology, (2) Arctic Technology, (3) Arctic Geophysics and (4) Arctic Geology. As figure 5 shows Norwegians represented 1/3 of students followed by Nordic countries (12%) and Germany (11%).

¹¹ *Ibidem*.

¹² Justis-og politidepartmenten. *Report to the Storting on Svalbard: Svalbard policy entering a new era*, Oslo 2016, available on-line: https://www.regjeringen.no/globalassets/upload/jd/vedlegg/faktaark/svalbard_eng.pdf (20/10/2016).

¹³ D. Aksens, *The University Centre in Svalbard 1993–2012*, Longyearbyen, 2013, available on-line: <https://brage.bibsys.no/xmlui/bitstream/handle/11250/280489/NIFUrappport2013-34.pdf?sequence=1> (15/10/2016).

STUDENT NATIONALITY 2015

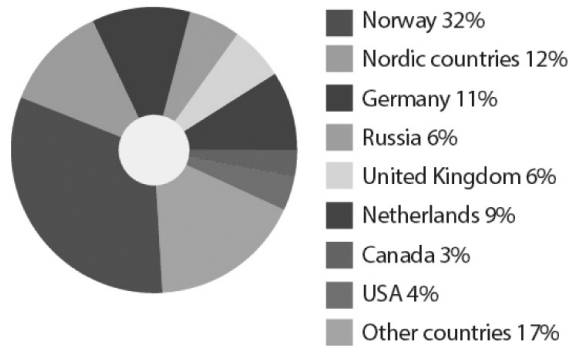


Figure 5. UNIS' student nationality (2015)

Source: Jessen E.T., *UNIS Annual report 2015*, Longyearbyen, 2015, available on-line: <http://www.unis.no/unis-annual-report-2015/> (20/10/2016).

UNIS constantly develops and respond to specific needs in the area. As a part of Ministry of Foreign Affairs Arctic 2030 initiative, UNIS was allocated the Arctic Safety Center project that aims to contribute to as safe and sustainable human activity in the high Arctic as possible and shares experience in how to operate in a safe and environmental manner in the high Arctic.¹⁴ It became vital after an avalanche in Longyearbyen in 2015.

In Longyearbyen there are numerous other scientific activities. First one is **EISCAT (European Incoherent Scatter Scientific Association)**, so incoherent scatter radar system established to conduct research on the lower, middle and upper atmosphere and ionosphere using the incoherent scatter radar technique.¹⁵ Another one is **Svalbard Science Forum (SSF)** created in 1998 that works as an information and coordination organ for research on the whole archipelago. Its main objectives are increased scientific cooperation within Svalbard research, increase coordination of activities, open sharing data and reducing environmental impact.¹⁶ SSF manages the **Research in Svalbard** database (RiS) that collects all the data from several thousand research projects conducted in Svalbard. The newest activity on research field is erecting **Czech Centre** for Polar Ecology. Near to the city inside mountain Platåberget **Global Seed Vault** a secured seed bank where variety of plant seeds is stored as insurance for the next generations, is located. The seed vault is an attempt to insure against the loss of seeds in other genebanks during large-scale regional or global crises. On the top of Platåber-

¹⁴ E.T. Jessen, *UNIS Annual report 2015*, Longyearbyen, 2015, available on-line: <http://www.unis.no/unis-annual-report-2015/> (20/10/2016).

¹⁵ EISCAT, *Welcome to EISCAT Scientific Association*, 2016, available on-line: <https://www.eiscat.se/about/> (20.10.2016).

¹⁶ The Research Council of Norway, *Svalbard Science Forum Report 2014*, Oslo 2015, available on-line: <http://www.forskningradet.no/prognett-ssf/Documents/1253977852390> (11.10.2016).

get the **Svalbard Satellite Station** (*SvalSat*) was established in 1996 and is the world's largest commercial ground satellite station and the location in Far North gives it a unique position. The satellite coverage at this latitude holds unique opportunities and SvalSat is the only commercial ground station in the world able to provide all-orbit-support (14 of 14 orbits) to owners and operators of polar orbiting satellites.¹⁷

Another town, where scientists are based is **Ny-Ålesund** is often called a research town since it is the biggest international research center in Svalbard where 10 nations (Norway, China, France, Germany, India, Italy, Japan, Korea, Netherlands and UK) hold their research centers. Mission of this project is to support the best interests of Arctic research and environmental monitoring.

POLICY TOWARDS SVALBARD FUTURE

Norwegian authorities permanently monitor situation in Svalbard and issue reports to emphasize areas that need to be developed in the region. In Storting report no 22 from 2008 objectives were set to:

- enforce consistent and firm Norwegian sovereignty,
- correct adherence to the Svalbard Treaty and verify compliance with the Treaty,
- maintain calm and stability,
- preserve the areas of unique natural wilderness,
- maintain of Norwegian communities in the archipelago.¹⁸

Report recognizes numerous of areas where changes are needed such as creating Svalbard and the High North Strategy, increasing need of regulation, climate changes and need of environment preservation, new opportunities in Svalbard scientific research and tourism activities as well as challenges within changes in coal mining industry.

Next communication about Svalbard was issued as a *White Paper on Svalbard* in spring 2016. Main goal presented in the White Paper is *by strengthening research, tourism and the general businesses the government will develop Svalbard further*.¹⁹ Paper states that knowledge is crucial for restructuring existing and create new industries. Pressure should be put on further expand of Svalbard as a platform of international research where Norway is a key player, not only facilitator. Government is to deepen an overall strategy involving all stakeholders

¹⁷ Kongsberg Satellite Services, *Svalbard Satellite Station (SvalSat)*, 2016, available on-line: <http://ksat.no/en/services%20ksat/svabard%20satellite%20station%20svalsat%20page/> (25.10.2016).

¹⁸ Storting, *Svalbard. Report No 22 (2008–2009) to the Storting*, Oslo 2009, available on-line: <https://www.regjeringen.no/en/dokumenter/meld.-st.-22-2008-2009/id554877/sec1> (11.10.2016).

¹⁹ Norwegian Government, *Press release, 2016-05-11, No: 60 – 2016: Storting, White paper on the future of Svalbard*, Oslo 2016, available on-line: <https://www.regjeringen.no/en/aktuelt/white-paper-on-the-future-of-svalbard/id2500474/> (11.10.2016).

as well as use new technologies and improve logistics to strengthen volume and quality of research. Role of natural environment preservation is stressed. One can clearly observe that more actions were introduced after rising interest in Arctic regions and strong political activities of Arctic states.

SUMMARY

Decisions taken over 2 decades ago by Norwegian authorities and implemented consequently show its results nowadays. Since beginning of 20th century Svalbard has been strongly linked to the mining industry that dominated until 1990s. Due to lowering prices of coal and rising cost of extraction, Norwegian government decided to stimulate other sectors. Main pressure was put into broad and diverse economic activity, as it was seen crucial for sovereignty. Adapting such a programme of changes into specific area such as Far North is, require solutions not only in economical ground but also in the social sphere.

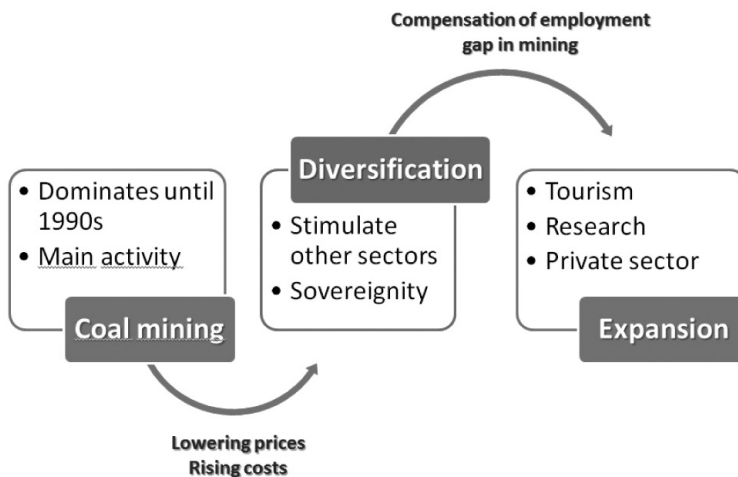


Figure 6. Periods of economic changes in Svalbard

Source: Own elaboration.

Thanks to Svalbard's natural advantages it became obvious to facilitate research, tourism and let the private sector flourish. Over 1,000 scientists from 500 institutions representing 90 nations took part in research in Svalbard in 2014. According to RiS almost 3,000 projects has been registered since 2011. Special environmental laws such as Environmental Protection Act has been implemented to ensure that fragile and unique environment of Svalbard will be preserved and protected. Not often debated advantage of developing research was the rise of awareness about Arctic environment and climate changes in polar regions as well

as gaining wide global audience thanks to international studies taken in this area. It was a challenge to find such solution that on one hand will allow economy to flourish after dominating industry started to face severe difficulties, on the other to help keep the specific structure of local communities that, as Norwegian governments states, are incredibly important to keep sovereignty of the archipelago. Research base has taken over and plays a huge role in support of local community. Activities connected with UNIS development such as Arctic Safety Centre, construction level III, or organizing help after avalanche in 2015, are only few examples. Not only it gave people job but also supported education about safety, made equipment more available, and most importantly strengthens the sense of community. It helped private sector to develop, especially services, as more people (tourists, scientist) decided to come to Svalbard. As author discusses above there is a major shift in economic activities on the archipelago since 1990s. Dominating coal industry faces a downturn due to various factors. Thanks to long term actions and successful implementation of policies Svalbard economy is less depended on mining and Store Norske. Historical background of the archipelago as well as natural advantages played major role in putting research as a third most important sector in Svalbard. Newly developed economic activities plays important role in sovereignty of the archipelago and grant substitute employment in other industries than mining helping to minimize employment gap that started to grow with closing mines.

Tytuł: Znaczenie badań naukowych dla gospodarki Svalbardu

Streszczenie: Celem poniższego artykułu jest przedstawienie aktualnych zmian w sytuacji ekonomicznej Svalbardu oraz podkreślenie wpływu badań naukowych na szczególną strukturę gospodarczą archipelagu. Na początku autorka krótko opisuje główne okresy w historii tego obszaru, jednak główny nacisk jest położony na bieżącą sytuację, a więc spadki w przemyśle wydobywczym przy jednoczesnym wzroście obecności naukowców, rozwoju Centrum Uniwersyteckiego na Svalbardzie, a także rosnącej roli turystyki polarnej. Dzięki zastosowaniu metod ilościowych, a także bezpośredniej obserwacji i wywiadów z mieszkańcami podczas pobytu autorki na archipelagu latem 2015 r., opracowanie odpowiada na pytanie badawcze, w jaki sposób badania polarne wpływają na gospodarkę Svalbardu.

Słowa kluczowe: Svalbard, Spitsbergen, gospodarka Svalbardu, badania polarne na Svalbardzie, przemysł wydobywczy na Svalbardzie, Centrum Uniwersyteckie Svalbard.

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