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THE ARCTIC IN A SPACE OF KNOWLEDGE

The Collection of Saint Petersburg State University Science Events Articles (2020–2021)

Editor Nadezhda Kharlampieva

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The collection includes materials of the following St Petersburg State University scientific events: Bilateral and Multilateral Regional Interaction in the Arctic (2020–2021); the Synergy of Languages and Cultures: Interdisciplinary Studies International Conference, the Arctic Region Peoples: Today's Sociolinguistic Context section (2020–2021). As a pilot project of the St Petersburg State University and the Arctic State Institute of Culture and Arts scientists, the collection also includes socio-philosophical publications of the Arctic Art & Culture magazine. The SAON extract of the Joint Statement of Ministers on the occasion of the Third Arctic Science Ministerial (9 May 2021, Tokyo, Japan) with commentary as a theme for discussion and continue previous edition of the St Petersburg University Press on arctic issues (2017, 2020) is given as an annex. The published materials will help to understand the Arctic knowledge space and to develop strategic scientific planning for the development of the Russian North and the Arctic.

The publication is addressed to the representatives of social and natural sciences, specialists in the field of international cooperation, ecologists and other researchers of the North and the Arctic.

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Chapter 1
A SPACE OF KNOWLEDGE OF THE RUSSIAN ARCTIC

THE ARCTIC MOUTH HYDROLOGY: THE HISTORY OF FORMATION AND THE DEVELOPMENT BASICS

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The article shows the history of formation and the basics of development of *the Arctic Mouth Hydrology* science field of the Russian Federation State Science Centre the Arctic and Antarctic Research Institute (hereinafter — AARI) and other Soviet Union and Russian science institutes and academic centres according to the provisions of the Constitution of the Russian Federation, approved on the 1 July 2020 all-Russian voting. The history of the Arctic Mouth Hydrology is given in seven stages (1925–2020). Structural and functional analysis of the AARI fund sources of the science and technical information and data, the field studies and findings, the research and methodical study of the Arctic Mouth Hydrology shows the following: First — the contribution of the Arctic Mouth Hydrology to hydrological science in general; Second — its interdependence from states historical stages; Third — the contribution of Soviet and Russian experts to the Arctic Monitoring & Assessment Programme (AMAP), the International Association of Hydrogeologists (IAH), the United Nations, etc. Further development of the Arctic Mouth Hydrology will undoubtedly be associated with the pooling of knowledge of social and natural sciences on water resources to meet the interests of society and nature, human and non-human relationship.

Keywords: Arctic Mouth Hydrology, water-basin principle, integrated ecosystem region.

Historical retrospective of the formation and the development basics of *the Arctic Mouth Hydrology* science field [Arctic Hydrology, 1991], as a regional part of the general hydrology [Glushkov, 1934; Gordienko, 1941] on aqua-territorial, physic-geographical, system-wide integrated Arctic representation [Arctic Atlas, 1985] within the competence of "The Nature protec-

tion. Hydrosphere. Classification of Water Bodies"[1], is based on the historical structural and functional research method. The Arctic Mouth Hydrology (hereinafter — AMH) includes surface water bodies of the Russian Arctic, comprising estuary areas of large-medium rivers, covering lower rivers and their estuarine swells (lips, bays, limans, lagoons, etc.) — as constituent parts of the water fund and the aqua-territorial complex of coastal zones located in internal surface waters of the Russian Federation.

The refinement of the AMH history and its development basics is connected with the the Constitution of the Russian Federation 2020 approval and the resulting federal legislation changes, as well as the disclosure of events, facts and research results stored in the private state AARI archives and funds. According to the Constitution of the Russian Federation, approved on the 1 July 2020 all-Russian voting, the territory of the Russian Federation includes the territories of its entities, internal waters and the territorial sea, airspace above them[2].

Water-basin principle and hydrographical zoning, which are the basis for the development of the modern state monitoring system of rivers and water resources estuarine regions and the management under water-resources, Water and Land codes and Environmental legislation in the Russian Arctic, taking into account the boundaries of the Arctic Monitoring and Assessment Programme (hereinafter — AMAP), monitoring and management systems, enable to represent the contribution of AMH to the modern information and communication "system of systems" and to reveal its practical significance in the social and economic science divisions [Ivanov et al., 2020].

The article is devoted to the history of formation and development of the AMH science field that is showing its prospect in contemporary research of the Polar regions — Arctic and Antarctic. The relevance of the AMH basics study is related to applied tasks, which are faced by the state — integrated infrastructure establishment; the environmental monitoring system improvement, considering the implementation of advanced technologies available; enhancement of international scientific and technological cooperation, cooperation in the global climate change division, nature conservation and efficient development of natural resources under environmental standards[3].

[1] Nature protection. Hydrosphere. Classification of water bodies. GOST 17.1.1.02-77. (In Russian)

[2] The Constitution of the Russian Federation (was adopted at National Voting on December 12, 1993), changing approved during the all-Russian vote. Amendments enter into force on July 4, 2020: official text as of 04.07.2020. URL: http://duma.gov.ru/news/48953/ (accessed: 13.02.2022). (In Russian)

[3] About of based on the state policy of the Russian Federation in the Arctic for the period up to 2035. Decree of the President of the Russian Federation 164: official text as of 05.03.2020. URL: https://base.garant.ru/73706526/ (accessed: 13.2.2022). (In Russian)

First stage. Transformation of the water issues management (1925, 1928, 1930).

Science its foundation on the 2 April 1920, the Committee of the Northern Sea Route (hereinafter — CNSR) under the Council of People's Commissars (hereinafter — CPC) began the history of creating Arctic shipping and solving the problems of developing the economy of the northern outskirts [Activity of Joint Stock Company "Komsevmorput", 1932]. By December 1924, CNSR relocated from Omsk and Krasnoyarsk to Novosibirsk where it existed until 1928. On 15 June 1928 the Labor and Defense Council, having considered measures to strengthen exports from Siberia under the CNSR, created the North Siberian State Joint-Stock Company for Industry and Trade "Komseveroput".

In 1928 to supervise scientific work carried out in the Arctic, the CPC established a Commission to develop a five-year plan, known as the Arctic Government Commission. The Central Executive Committee and the CPC of the Union of Soviet Socialist Republics (hereinafter-USSR) adopted a resolution on the unification of the hydrological and meteorological service of the USSR on 7 August 1929. The USSR Hydrometerological Committee regulation was approved on 27 August 1929. The Arctic Government Commission was abolished on 15 May 1933 due to the formation of the State Administration of NSR at the CPC of the USSR and at the Central Executive Committee of the USSR on 17 December 1932. On 22 November 1930 the Presidium of the Central Executive Committee of the USSR decided to establish the All-Union Arctic Institute/Vsesojuznyj Institut Arktiki (hereinafter — VAI), that was supposed to comprehensively explore the Arctic region, unite related organisations in order to plan their work in a single way [Gakked, 1945]. The Research Institute for the Study of the North that was engaged in the search of new fuel sources and the development of the fish wealth of the Barents Sea has played an important role in the establishing of the joint organisation. The occasional Kara and Kolyma cruises, organised during this period, indicate the beginning of the deployment of ship caravans with mandatory icebreaking and scientific support for economic development along the Arctic Seas.

Second stage. Description of the lower reaches and mouths of the main rivers, the organisation of polar stations in the Arctic (1930-1953). The formation of the science field on arctic hydrology and water resources date back to the VAI foundation in 1932. The River Hydrology Sector as well as the Sector of the Sea within Hydrological Research Department of VAI was set up under the initiative of V. Vizé. The staff of the River Hydrology Sector was formed by specialists from the State Hydrological Institute/Gosudarstvennyj Gidrologicheskij Institut (hereinafter — GGI) due to its re-

organisation (hydraulics, hydrological technicians of waterways and ports, hydrological physicists, etc.). Since 1932 under the General Governance of the North Sea Route/Glavnoe upravlenie Severnogo morskogo puti (hereinafter — GUSMP) objective has been hydrological expeditions organisation and carrying out the study of the lower reaches and lower estuaries of large Siberian rivers, which enter the Arctic seas, to obtain hydrological navigation and polar stations in these areas. The bottoms and lower reaches of all main rivers of Siberia and North-East of the Russian Arctic from Ob to Kolyma rivers were surveyed during seven years since 1932 to 1940 years. This includes the primary sea and river ports construction and expansion as well as hydrological stations and posts opening in the estuarine regions of the Siberian and North-East of the Russian Arctic rivers.

VAI's tasks of the Arctic rivers hydrology were formulated in 1936 by senior hydrologist L Davydov. These were drawing up an aquatic inventory of the Arctic territories, studying the hydrological regime and the processes of water bodies, composing a monographic description of river objects to exploit their potential resources. The Kurey Ice-technic Expedition to Yenisey and Kureyka rivers was launched under the leadership V. Antonov and others in 1938.

At the same time including the World War II years, assessments of river waters inflow and their impact on the "ice and water" regime at the rivers estuaries, Russian Arctic coastal areas and others were conducted (V. Antonov, B. Zaikov, M. Zotin, and others). The purpose was to provide scientific and operational navigational forecasts and warnings on NSR in the rivers lower reaches and estuaries of the Laptev Sea and the East Siberian Sea (K. Balashov, V. Ulitin and N. Maslaeva). After the World War II the division of river hydrology continued expeditionary research on the hydrological navigation aids compilation, developed hydrological stations and posts, developed long-term icing forecasting techniques, primary for the scientific and operational navigation of the estuaries of the Siberian rivers approaching the Northern seaports. The River Hydrology Sector of the Russian Arctic was led by A. Burdykina and I. Samburenko.

Third stage. Providing navigation with icing hydrological forecasts on the North Sea route and projects development for the fundamental improvement of navigable conditions at estuarine bars and Siberian and North-East of the Russian Arctic rivers ledges (1953–1964).

The AARI River Hydrology Sector that searched and studied rivers of Siberia and North-East of the Russian Arctic was transformed into a Department of the Mouth Hydrology (head — V. Antonov) followed the subordination of GU SMP to the unified Ministry of Maritime and River Navy. At that time, the main tasks were to ensure navigation in ice conditions and

to improve the dimensions on inland waterways at the Siberian and North-East of the Russian Arctic rivers reaches. The event that determined this change was the successful rescue of ships frozen on shipping lanes in the basin of the river Lena in autumn 1952 (V. Antonov, I. Peschansky, M. Fedorov, A. Burdykina). Under the direction of V. Antonov the division developed a plan of activities to rescue the Lena fleet. It was led by the A-144 expedition, which included the Ice Laboratory (supervised by I. Peschansky, V. Lavrov) and the A-66 Aerometod Laboratory (A. Gaudis and N. Shakirov). Long-term of 1–2 months forecasts were issued, which made it possible for vessels to be assigned crews for ships to be released promptly on ice-covered routes. These vessels got moved rapidly to the estuaries of small rivers during the period of the ice drift, before the flood falls, and exposed the ships. The headquarters carried out the operations directly from the aircraft and at the same time, aerological surveillance was carried out. These resources were used to observe the autopsy of the Bykovaskya duct/Bykowskaya Mys and then to determine the morphometry of the navigable ducts after the ice drift. Besides hydrometric surveys were carried out at the Bykovskaya duct's permeating beams to develop projects for the fundamental improvement of navigational conditions. The Yakutsk Hydrometeorology services supported the rescue of the fleet. This experience was well received and contributed to the expansion of the Department of Mouth hydrology. Besides, exploratory river exploration has become a distinct form of expeditionary, scientific and operational activities of the Institute on inland waterways (expeditions A-113 and A-114 in the river reaches, mouth hydrology all of arctic rivers).

Between 1954 and 1964 hydrological vessel expeditions have been working on engineering research programmes to develop the radical improvement projects of navigation restrictions of Siberian and North-Eastern Russian Arctic rivers and reaches, involving physical modeling, numerical methods and estuarine process calculations (V. Antonov, M. Fedorov, V. Ivanov, Yu. Nalimov). These activities were accomplished in addition to traditional methods of forecasting and warnings on water routes. Surveying, initiated by the Irtysh Basin Authority in the 1960s in the Ob delta and related to the selection of a rational option and the introduction of specific activities to open a deep path from the Ob Lip/Obskaya Guba through the Yamsal Bar deeper into the Ob-Irtysh basin, was confirmed by AARI's precautionary calculations with a fundamental interference with nature [Antonov and Fedorov, 1965, p. 82–91].

The generalized experience in engineering and hydrological calculations [Antonov, 1957, p. 5–12; Antonov and Burdykina, 1959, p. 43–53] was presented at the Third All-Union Hydrological Congress (7–17 October

1957) and was also taken into account in the elaboration of the Union-wide and agencies normative.

Fourth stage. Contribution of Arctic estuarine hydrology to the International Hydrological Decade (1965–1974).

On this stage the processing of accumulated material as part of the implementation of commitments made at the International Hydrological Decade (IHD) in terms of water resources and water balance began. The International Hydrological Decade (IHD), proclaimed at the 13th session of the General UNESCO Conference in November 1964 with 96 participating countries, was a significant event that identified hydrology as a distinct scientific division with a far-reaching perspective in the science's development[4]. The years of IHD in AARI can be divided into two sub-periods: 1965 to 1971 and 1971 to 1974. At the beginning of IHD (1965–1971), Department of the Mouth Hydrology scientist and engineering activities were mainly directed towards rivers of arctic hydrological studies of Arctic water bodies within the AARI's framework of the IHD programme and summarizing the scientific and expeditionary research on mouth rivers basins in the post-war period under the supervision of V. Antonov, N. Doronin, V. Ivanov, A. Piskun, Z. Solovyeva, N. Maslaeva, N. Komov, I. Osipova, and others. At this stage, several monographs and scientific summaries were published in AARI scientific publications and other journals. As a result, guidelines for hydrological research and calculating elements of a hydrological regime in the coastal zone of the seas and the estuaries of rivers in engineering studies have been developed [Ivanov, 1974, p. 4–13]. Since 1971, Prof. V. Antonov dedicated himself to organising and conducting expertise and postgraduate hydrological studies for the rest of his life.

In the second half of IHD (1971–1974) the results of the first phase were implemented in integrated projects carried out by the Institute for seas and estuarine regions of the Arctic Ocean (AO) under the scientific supervision of an academician A. Treshnikov — director of AARI. The Laboratory of Water Resources has been established in 1971. Department of Mouth Hydrology and Laboratory of Water Resources (head — V. Ivanov) leading with the assignment of responsibility for the IHD's AARI projects completion.

At the Fourth All-Union Hydrological Congress, held in 1973, the mouth of large rivers of Siberia and North-East of Russian Arctic were recognized for the first time as a separate object of study, together with the lakes and reservoirs[5].

[4] Proposals for an International Hydrological Decade. Preparatory Meeting of Experts in the Field of Scientific Hydrology, Paris, 1963. UNESCO/NS/NR/22, WS/0463.22. URL: https://unesdoc.unesco.org/ark:/48223/pf0000138698_eng (accessed: 10.03.2020).

[5] Proceedings of the IV All-Union Hydrological Congress. 1976. Vol. 10. Leningrad: Gidrometeorologii Publ. (In Russian).

Consequences of the AARI's head unit activities in IHD period were the following: standardization of estuary zoning; basic principles of hydrological-morphological zoning of rivers estuaries in the Arctic; "Water of the land" section execution in the Arctic Atlas, which included the studied run-off maps, average annual and intra-annual flow distribution over the catchment area of the Arctic Ocean (N. Doronina, V. Ivanov); preparation of the monography "Arctic" section for publication [Ivanov, 1976, p. 4–26] and Atlas of "World Water Balance and Water Resources of the Earth" [World Water Balance and Water Resources of the Earth, 1974] with the following organisations — State Hydrological Institute (A. Sokolov, K. Voskresensky, N. Alyushinskaya, O. Drozdov), State Geophysical Observatory (V. Sharova, L. Zubenok), AARI (V. Ivanov, E. Korotkevich).

Thus, the research on the World Water Balance and Arctic Water Resources carried out at the AARI contributed to the renamed of the Department Mouth Hydrology into the Department of Arctic Mouth Hydrology and Water Resources (hereinafter — AMH WR) with a laboratory-group structures in 1976 (head — V. Ivanov).

Fifth stage. The Department of the Arctic Mouth Hydrology and Water Resources as a main unit of AARI (1975–1990).

Since 1976 the area of research of the AMH and WR Department — the main unit of the AARI, has been fully subordinated to the tasks of hydrotechnical construction and territorial flow redistribution on the Mouth hydrology zones of Arctic seas regions. Many departments of the AARI were involved in this work under the scientific supervision of A. Treshnikov and the responsible executor of V. Ivanov [Treshnikov and Ivanov, 1980, p. 6–12; Ivanov, 1980, p. 30–43]. To support this work, expeditions A-68, A-117, A-118 subsequently renamed as mouth zones of Ob-Yenisey river expedition operated together.

In 1986 at the Fifth All-Union Hydrological Congress, the mouth rivers basin regions were finally recognized as separate mouth water bodies[6] along with lakes and reservoirs, including in state standardization due to water transport development on Siberian and the North-Eastern of Russian Arctic rivers, transportation of combined navigation vessels of the "river-sea" type and extension of guaranteed navigation on large rivers.

This period coincides with time of the governmental study programme about redistribution of the flow of Siberian rivers to the South. The AARI had been included in part of the programme concerning estimating and detection of influence factors to natural conditions and economic activity of

[6] Estuarine of the rivers. 1990. *Trudy Vsesojuznogo V Gidrologicheskogo S'ezda* 9. Mikhailov and Ivanov (eds). Leningrad: Gidrometeoizdat Publ. (In Russian)

the Russian Arctic. In this part of the programme the following co-organisers were involved: the Institute of Water Problems of Academy of Science (G. Voropaev, S. Vendrov, V. Debolsky), the Leningrad Polytechnic Institute (M. Mikhalev), Moscow State University (V. Mikhailov), the Leningrad Meteorological Institute (Yu. Doronin), State Institute of Oceanography (S. Baidin), GGI (V. Vuglinsky)[7, 8] [Venderov, 1979].

The USSR State Award in 1981 year was the other remarkable event of this period. Participants of UNESCO International Hydrological Decade's projects on the world water balance from USSR including member and head of the AMH and WR Department V. Ivanov, A. Balabaev and N. Komov were given another Award of the State Prize in the field of science and technology of the USSR for the ice-scouting instrumentalities on Siberian rivers.

The international activity of the AMH and WR Department division was strengthened in 1985 due to participation in the Arctic Monitoring Assessment Programme (AMAP), in the National Committee of the International Association for Hydrological Research (IAHR).

Stage six. The Arctic Mouth Hydrology and Water Resources scientific direction to an abiotic component in Arctic aquatic ecosystems (1991–2008).

Since 1991 the AMH and WR Department has been supplemented by a new field — ecology. Implementing a scientific and technical programme, in which many other subdivisions of the institute have taken part with their research subjects (geography, medicine, oceanology, etc.) in this field. In the period of the AARI performance until 1992 the scientific activities of the the AMH and WR Department were expanded to a scientific generalization to Siberian and North-East rivers of the Russian Arctic, basin regions of rivers of the Russian Arctic, study and development of icing and hydrological long-term forecasting methods, calculation and modeling for navigation purposes (V. Antonov, Z. Solovyeva, A. Piskun, T. Vinogradova, M. Tretiakov etc.)[9].

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[7] Mikhailov V. 1990. Problems of study, use and protection of the estuaries of rivers. Estuarine of the rivers. *Trudy Vsesojuznogo V Gidrologicheskogo S'ezda* 9: 5–18; Mikhalev M. Dynamics of water and river processes in river deltas. Ibid. 9: 39–41; Ivanov V., Makeev V. The role of hydrological and other natural factors in the long-term formation of the estuary regions of the rivers of the Arctic zone. Ibid. 9: 65–744; Doronin Yu. The processes of interaction of river and sea waters on the estuaries (physical bases numerical modeling). Ibid. 9: 122–129. (In Russian)

[8] Ivanov V., Vuglinsky V. 1994. Studies of Hydrological Processes in the Arctic Zone of Russia. Book of Abstract ACSYS. *Scientific Conference on the Dynamics of the Arctic Climate System.* Geteborg, Sweden: IP-4.

[9] Tretiakov M. 1999. Three-dimensional hydrodynamic model of the main hydrological processes on a seasonal time scale in the Arctic estuaries. Final session of the AARI Scientific Council: 77–78. St Petersburg: AANII. (In Russian)

In 1999–2000 the AMH and WR Department undertook a competitive project "Integrated studies of anthropogenic and natural changes of ecological systems abiotic components of sea-river estuaries in Russia" (leading by V. Ivanov) with the participation of State Institute of Oceanography on southern seas estuarine regions (V. Brysgalo, Z. Solovyeva, V. Makeev, O. Medkova, etc.). In 2005 due to operational activities reorganisation the Ice and Hydrological Forecasting Laboratory of the AMH and WR Department was transferred to the Informational Centre of Ice Hydrometeorology of AARI together with the responsibility for issuing operational forecasts regarding of the Russian Arctic river's opening and freezing. Until 2008, the department worked on realization of the state scientific and technical target programmes of Roshydromet — "Integrated oceans and seas investigation" (V. Ivanov, V. Zamiatin, A. Piskun, V. Zimichev, M. Tretiakov, etc.). Since 2000 the AMH and WR Department has been carrying out expeditionary activities to study surface water objects in the Svalbard and North Zemlya archipelagos. Projects co-executors were the Leningrad Polytechnic Institute (M. Mikhalev), State Chemical Institute (A. Nikanorov, V. Bryzgalo), Zoological Institute (V. Khlebovich).

Seventh stage. Elaboration of the AMH and WR Department to the system-wide integrated water management projects development for surface water bodies monitoring of the Arctic (2009–2020).

Since 2007 the current focus research of the AMH and WR Department as well as Roshydromet regarding hydrology is determined by the Government of the Russian Federation resolutions and orders of Roshydromet after the introduction of the new Water Code of the Russian Federation (2006)[10] and based on Strategy of Inland Water Transport Development until 2030[11]. Since 2011 the department is headed by M. Tretiakov [Holmes et al., 2016; Treiakov, 2020, p. 257–263].

The AARI AMH and WR Department is moving on to the complex system development of water management projects for monitoring water bodies based on the water-basin principle, hydrographic zoning of the Russian Arctic rivers (as basins of Russian Arctic aqua-ecosystems).

In 2012–2014 the Department performed scientific activities within the Federal target programmes/ Federal'naja celevaja programma framework of "Water management complex development of the Russian Federation in

[10] Water Code of the Russian Federation 2006: official text: as of 30.12.2021. URL: http://pravo.gov.ru/proxy/ips/?docbody=&nd=102107048 (accessed: 13.2.2022). (In Russian)

[11] Strategy for the Development of inland water transport of the Russian Federation for the period up to 2030: official text: as of 01.03.2016. URL: http://government.ru/docs/22004/ (accessed: 13.02.2022). (In Russian)

2012–2020", "Improvement of methods and technologies of hydrological forecasts formation at the bottom and mouth of large rivers in the Russian Arctic zone", "System projects design of hydrological network development and modernization for river basins of the Russian Federation", "Modern and prospective assessment of water resources and water supply in the Russian Federation", "Methods development for accounting and predicting the characteristics of the terrestrial water bodies hydrological regime under consideration of climate change and anthropogenic load for the hydrological justification of the design, construction and operation of the country's water management complex and reduction of negative and harmful effects of waters" (M. Tretiakov, V. Ivanov, A. Piskun, R. Terekhova, E. Rumyantseva, O. Golovanov, O. Muzhdaba, etc.).

Since 1936, when mouth arctic hydrology had been established in AARI, the "Hydrology and Water Resources" and "Oceanography" postgraduate programmes have been conducted. Within these specialisations the Arctic Mouth Hydrology is given as an education discipline. The staff of the Department has been carrying out pedagogical work (V. Antonov, V. Ivanov) and conducted courses on hydrosphere, hydrology and water resources at St Petersburg University (SPBU), State Polar Academy (SPA), and Russian State Hydrometeorological University (RSHU). More than 20 postgraduate students from various institutions in Leningrad have graduated from these studies over the years and continued their work in AARI, Murmansk Branch, Arctic Hydrometeorological Service and other institutes.

As a result of the activity of the AARI AMH and WR Department for the study of patterns formation and assessment of water resources in the Arctic and the scientific school "The Arctic Mouth Hydrology" are formed. The area of the division activity from the foundation up to date covers the rivers basin of Russian Arctic region of the large and medium rivers located in the terrestrial waters of the Russian Arctic as scientific area and the Arctic zone of the Russian Federation as region of administrative — territorial governance as shown at Fig.

Conclusion

Prospects of the Department of the Arctic Mouth Hydrology and Water Resources in the coming years relate to scientific research development on the methods and technologies design for operational hydrological forecasts, research of the water balance and water resources, the surface waters space monitoring in the Arctic, including mouth rivers basin region of large rivers and water bodies in scientific inpatient facilities of the AARI and their changes under the influence of natural and anthropogenic factors [Tretiakov

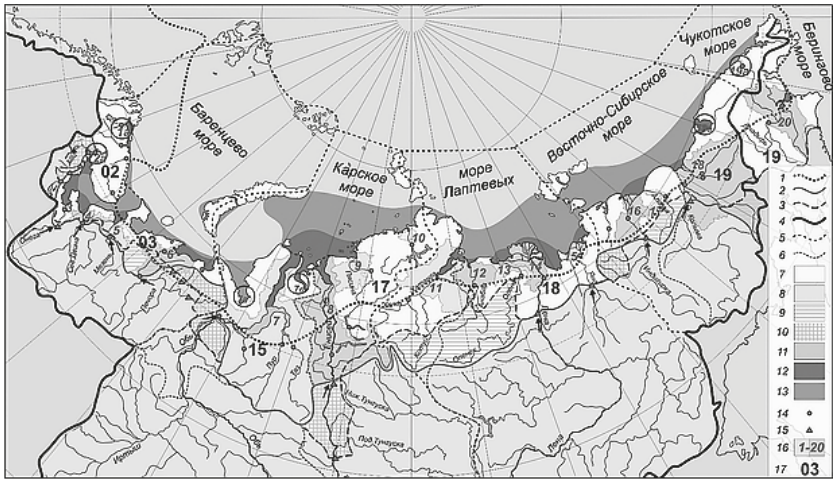

Fig. The Mouth Hydrology in rivers basin regions located inland waters of the Russian Arctic (Ivanov and Kharlampieva, 2020, p. 11]

Borders are as follows:

1 — physical geographical (1985); 2 — water resource (1990) (aquatic ecological (2007), hydrographic (2016)) of the Russian Arctic; 3 — administrative territories of the Arctic zone of the Russian Federation (2014); 4 — watershed of the Arctic Ocean; 5 — sea basin catchments; 6 — catchments of water basins.

Reservoir basins are as follows:

7 — rivers of the Russian Federation Arctic zone within boundaries of administrative territories; 8 — rivers outside the Arctic zone of the Russian Federation; 9 — Arctic rivers within the water resource (hydrographic) boundary of the Russian Arctic zone; 10 — rivers of the Arctic beyond the water resource (hydrographic) boundary of the Russian Arctic zone.

Zones are as follows:

11 — year-round freshwater; 12 — freshwater at maximum flow and saline at minimum flow; 13 — distribution of river waters in the seas.

Main-stream stations are as follows:

14 — closing main-stream hydrometrical station on main rivers;

15 — frontier main-stream hydrometrical station on the water resource (hydrographic) boundary of the Russian Arctic zone;

16 — the mouth rivers basin space number of large and medium (the number with index in the circle) rivers (1 — Kolsko-Tulomskaya; 2a — Kandalakshskaya; 3 –Onezhskaya; 4 — North Dvina; 5 — Mezen and Kuloya; 6 –Pechorskaya; 7 — Obsko-Tasovskaya; 7a — Baidaratskaya; 7b — Gydanskaya; 8 — Yeniseyskaya; 9 –Pyasinskaya; 10 — Nizne-Taimyrskaya; 11 –Khatangskaya; 12 — Anabarskaya; 13 –Olenekskaya; 14 — Lenskaya; 15 — Yanskaya; 16 — Indigirskaya; 17 — Alazeyskaya; 18 –Kolymskaya; 18a — Chaunskaya; 19a –Amguyemskaya; — 20 — Anadyrskaya).

17 — water basin district number according to Water code of Russian Federation (02 — Barents-Belomorskaya; 03 — Dvinsko-Pechorskaya; 15 — Nizhneobskaya; 17 — Yeniseiskaya; 18 — Lenskaya; 19 — Anadyro-Kolymskaya).

and Ivanov, 2018 p.190–200; Kharlampieva et al., 2017, p. 218–223] including the development and improvement of methods and technologies for

their diagnosis, calculation and forecasting, as well as continuing to participate in improving socio-ecological approach and international expertize work[12] [Kharlampieva, 2017; Kharlampieva, 2018]. The next tasks of the Arctic Hydrology will undoubtedly be the fulfillment of state monitoring of the Arctic water resources, their protection and rational use, combining knowledge of social and natural sciences concerning water resources to satisfy the interests of society.

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THE INDIGENOUS PEOPLES' COOPERATION ON PROTECTION OF INTANGIBLE CULTURAL HERITAGE

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The article examines the dynamic development of the concept of cultural heritage in the context of the international movement for the protection of the rights of indigenous peoples. Particular attention ispaid to UN agencies in developing engagement with indigenous peoples and their role in promoting intangible heritage. The article reviews the Russia's involvement in global movement of indigenous peoples and international cooperation on the issue of intangible heritage. The attention is paid to Sami experience and the potential of their transboundary institutions, agreements and initiatives. Using the example of some regions in the North-Western Russia inconsistencies between legislative stance and practically visible measures are identified.

Keywords: Indigenous Peoples, Intangible Cultural Heritage, UN agencies, regional policy, cultural institutions.

Introduction

Since the last third of the 20th century international cooperation appeal to supranational organisations has become an effective strategy for organisations of indigenous peoples in promoting their interests, protecting rights, as well as in influencing national governments.

Describing the international movement of indigenous peoples, which is currently complemented by the transnational strategies of peoples belonging to several nation States, researchers use the term "global" movement [Yudin, 2011] or "global network society" of indigenous peoples [Coleman, 2019] — implementing global public policy towards indigenous peoples. It is focused on the UN and other supranational institutions, the support of which helps to put pressure on the government of the national States. However, in the work of UN agencies, problems of a lack of effective representation of indigenous peoples and a fragmented approach to the cultural heritage of indigenous peoples still remain[1].

This article is based on a literature review as well as content-analysis of the United Nations and specialized agencies documents, the documents of

[1] Swiderska K. & Argumedo A. Towards a holistic approach to indigenous knowledge protection: UN activities, "Collective bio-cultures heritage" and the UNPFII. Fifth Session of the UN Permanent Forum on Indigenous Issues, May 15–26, 2006, New York. URL: https://www.researchgate.net/publication/319773490_Towards_a_Holistic_Approach_to_Indigenous_Knowledge_Protection_UN_Activities_Collective_Bio-Cultural_Heritage'_and_the_UNPFII (accessed: 05.01.2022).

governmental departments, regional laws and target programmes, materials of indigenous organisations and regional cultural institutions and media messages. A case study method which includes analysis of heritage regulations, policies and standards in few regions in the North-Western Russia offers an insight into the situation of right to cultural heritage with special reference to indigenous peoples' rights in greater level of depth.

Intangible Heritage and Global Movement of Indigenous Peoples

The protection of the cultural rights of indigenous people is inseparable from their territorial rights and the right to self-determination. Fragmentation of heritage and heritage rights can be a threat to them**.**The indigenous peoples' efforts to participate in cultural heritage protection is currently driven through the work of the United Nations Permanent Forum on Indigenous Issues established in 2000, Expert Mechanism on the Rights of Indigenous Peoples and Special Rapporteur on the right of Indigenous Peoples and lead to transformative impact on how the obligations under the UN agencies concerning intangible heritage are defined and implemented by states [Antons, Logan (eds), 2018].

In the 1980s and 1990s, the UN Working Group on Indigenous Peoples played a key role as a global forum for indigenous organisations and activists. The Working Group on Indigenous Peoples, along with the Declaration on the Rights of Indigenous Peoples, has promoted a holistic approach to the cultural heritage of indigenous peoples, including tangible and intangible components, as well as traditional habitat and biological resources. Expert Mechanism on the Rights of Indigenous Peoples succeeded the Working Group in 2007 and recognized that the categorization of heritage as "tangible", "intangible", and "natural" is an inappropriate in the case of indigenous peoples. The indigenous culture was interpreted as "a holistic concept" which "include tangible and intangible manifestations of their ways of life, achievements and creativity, and are an expression of their self-determination and of their spiritual and physical relationships with their lands, territories and resources"[2]. This view was influenced by the discussions at the Expert Seminar on Indigenous Peoples' Rights with respect to their Cultural Heritage, organised by the Office of the High Commissioner for Human Rights (OHCHR) and the University of Lapland in Finland in 2015.

[2] Promotion and protection of the rights of indigenous peoples with respect to their cultural heritage. Study by the Expert Mechanism on the Rights of Indig-enous Peoples. 2015. URL: https://undocs.org/Home/Mobile?FinalSymbol=A%2FHRC%2F30%2F53&Language=E&DeviceType=Tablet (accessed: 05.01.2022).

The seminar included presentations by many Sami representatives as well as experts from the University of Lapland. The example of Saami initiatives in the field of cultural heritage which is considered as an aspect of cultural struggle shows that the protection of the cultural rights of indigenous peoples is inseparable from their territorial rights and the right to self-determination.

With the same spirit of complementarity, the Scandinavian experts consider the process of heritage listing as a backdoor not only for wider cultural heritage protection but especially for political claims. Based on examining indigenous music, musical performance, including festivals as well as indigenous celebrations and sport, they conclude that the cultural heritage has become a politicized field [Sikora et al., 2021; Pedersen, 2011; Hilder, 2012]

The transnational institutes, initiatives and agreements of the indigenous peoples, like Sami, inhabiting the Arctic regions of Norway, Sweden, Finland and the Russian Kola Peninsula, represent the example of vital importance to the whole of the international community. The experience of the Sami, which correlates with ongoing UN agencies initiatives, shows how the indigenous people (or indigenous peoples), across national borders, through international cooperation, form their own approach to cultural heritage, integrate it into the strategies of states in the field of cultural heritage protection and thus ensure sustainable development.

According to Nordic Sami Convention, the traditional knowledge and traditional cultural expressions of the Sami people, integrated with the people's use of natural resources, constitutes a part of the Sami culture; Sami cultural heritage shall be protected by law and shall be cared for by the country's Sami parliament or by cultural institutions in cooperation with the Sami parliament[3].

Intangible Heritage and Indigenous Peoples in Cultural Strategy of UNESCO

Since 2003 the Permanent Forum has encouraged states to endorse the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage and yet recommended UNESCO to explore the links between the protection of tangible cultural heritage, intangible cultural heritage and sacred sites with a view to broadening, strengthening and streamlining the protection of (indigenous) cultural heritage.

The leading role in the inclusion of intangible cultural heritage in the international legal circulation, in its definition and development of ap-

[3] Nordic Saami Convention, 2017. URL: https://www.regjeringen.no/globalassets/upload/aid/temadokumenter/sami/sami_samekonv_engelsk.pdf (accessed: 05.01.2022).

proaches to the preservation of this aspect of heritage belongs to UNESCO [Blake, 2020]. Since 2001, when the UNESCO Universal Declaration on Cultural Diversity, recognizing the protection of cultural diversity as an ethical imperative and the associated obligation to respect the rights of indigenous peoples, was adopted, indigenous peoples have been taken into account in UNESCO's norm-setting activities and their cultures have come to be seen as a part of the world's cultural diversity. The Convention for the Safeguarding of the Intangible Cultural Heritage (2003) also referred to indigenous peoples and provided, in the development of specific standards and mechanisms, the potential for indigenous peoples to participate in the implementation of the convention, thereby strengthening their rights to assert, to protect, to develop their cultural heritage, and to control it. The category of intangible cultural heritage has promoted the recognition of previously marginalized forms of heritage, democratized the process of giving value to the heritage, focused on local communities, as well as focused on non-location-based forms of heritage that often transcend national boundaries. The emergence of international nominations promotes subregional or transnational cooperation in the protection of intangible heritage.

In 2019, at the UN Permanent Forum on Indigenous Issues, a round table on the role of the Convention for the Safeguarding of the Intangible Cultural Heritage for Indigenous Peoples was held. Synergy, a joint movement between the Permanent Forum and the Convention on Intangible Cultural Heritage Bodies in protecting the rights of indigenous peoples, was declared. The UNESCO Convention has been named as a tool for realizing the cultural rights of indigenous peoples. The implementation of the Convention was associated with the strengthening of international cooperation between indigenous peoples in such forms as exchange of experience and information, identification of best practices, nomination of cultural heritage sites, implementation of joint projects for their preservation, regional and international cooperation for the preservation of the common intangible heritage by indigenous communities divided by borders different countries[4].

Russia's Involvement in Global Movement of Indigenous Peoples and International Cooperation on the Issue of Intangible Heritage

A former member of the United Nations Expert Mechanism on the Rights of Indigenous Peoples and current member of Permanent Forum on Indigenous Issues Aleksei Tsykarev has supported the initiatives urging

[4] Meetings on intangible cultural heritage (co)organized by UNESCO, 2019. URL: https://ich.unesco.org/en/events?meeting_id=00728 (accessed: 05.01.2022).

the ratification of the Convention on Intangible Cultural Heritage in Russia as well as the ideas of joint applications with Finland (Kalevala, traditional runes singing) and with Estonia (the dugout boat) for the inclusion of Finno-Ugric cultural heritage to the UNESCO Intangible Cultural List.

The example of Russian element of intangible cultural heritage, Olonkho, Yakhut Heroic Epos, illustrates that inclusion in the UNESCO Intangible Cultural List contributes to the development of the regional actions to identify and protect intangible cultural heritage, as well as international and regional cooperation. Since 2015 International epic forums and festivals of storytellers under the auspices of UNESCO in the Yakutia (Sakha) Republic have been aimed at revitalization and protection of oral storytelling in the Eurasian region[5].

Russia has not ratified the UNESCO Convention, but in 2003, the Russian Committee for the Preservation of the Intangible Heritage, which united regional Houses and Centres of Folk Art, has been created; in 2008, the Concept for the Preservation and Development of the Intangible Cultural Heritage of the Peoples of the Russian Federation for 2009-2015 has been developed and the Unified Electronic Catalogue of Intangible Cultural Heritage Sites (Register of Intangible Cultural Heritage) has been set [Purtova, 2019].

The institutional structure for the protection of intangible cultural heritage in Russia includes state and non-state actors: federal and regional executive authorities, municipal administrations, regional houses of folk art, scientific and educational organisations, regional ethnographic museums and museums of culture and everyday life, public organisations in the region and abroad. Ethnocultural centres have acquired particular importance in the Northwestern Federal District of Russia.

Holding festivals, fairs, celebrations, competitions, creating ethnoparks, as well as organising expeditions are important mechanisms in the preservation and promotion of intangible heritage and they are supported by regional legislation, regional target programmes and projects. Such initiatives are being implemented in close cooperation of regional and municipal authorities with communities and public organisations of indigenous peoples. Community participation is expressed in the creation of folk groups, the organisation of exhibitions of folk art, workshops, conferences, publications. An important area of the communities' activity is cooperation with related organisations in various regions of the country and abroad.

[5] Periodic reporting on the Convention for the Safeguarding of the Intangible Cultural Heritage. 2020. URL: https://ich.unesco.org/en/state/russian-federation-RU?info=periodic-reporting#pr-2015-2015 (accessed: 05.01.2022).

In a number of regions of the Russian Federation, museums closely related to local communities are recognized as the leading organisations that stimulate the development of regional initiatives in the field of intangible cultural heritage protection. This trend is in line with the international museum movement. In 2004, the International Council of Museums has recognized museums as key mechanisms for the documentation, preservation, and promotion of intangible cultural heritage and called for a close relationship between tangible and intangible heritage.

National republics achieve more impressive results in supporting the heritage of indigenous peoples, possibly due to the fact that the ethnic culture of indigenous peoples is the hallmark of the region, the most important component of its brand, which forms the cultural, tourist and recreational potential of the region. Furthermore, ethnicity stimulates the development of active relations between the region and "kindred" countries.

However, regional legislation has a rather peculiar attitude towards lists and follows in the arbitrary logic of the Russian bureaucratic decision-making system [Sikora et al., 2021]. Despite the lack of special regional legislation on intangible heritage as well as the inventory, which has been strongly advocated by Karelian non-governmental organisations, the Republic of Karelia had proclaimed 2021 the Year of traditional runes singing. While in the Murmansk region and the Komi Republic, the regional registers of intangible heritage were established and could be used as tool for the wider cultural and political self-determination of indigenous people and strengthening their position in the politics of these regions.

The Perspectives on the Issue of the Intangible Heritage

A large dominance of regional programmes as well as greatest participation of the cultural institutions in the safeguarding of intangible heritage defines current activities in Russia. Such approach implies a focus on the recreational activities. According to the statement of the Head of FederalAgency for NationalityAffairs Igor Barinov at the 15 session of the UN Permanent Forum on Indigenous Issues, "traditional music and arts are presented in various museums in the country and performed in many festivals, national holidays and concerts. At all levels the efforts are being made to preserve the cultural heritage, including intangible heritage of indigenous peoples, measures for supporting their languages are being implemented"[6]. A

[6] Igor Barinov headed the delegation of the Russian Federation at the 15th session of the UN Permanent Forum on Indigenous Issues. *Igor' Barinov vozglavil delegatsiyu Rossijskoj Federatsii na 15-j sessii Postoyannogo Foruma OON po voprosam korennykh narodov.* URL: https://fadn.gov.ru/press-centr/news/igor-barinov-vozglavil-delegaczi-

holistic approach to the indigenous heritage is better manifested in creation of territories under traditional nature management by indigenous peoples and taking into account their ethno-cultural needs in education.Safeguarding of indigenous intangible cultural heritage is frequently associated with the development of ethno-tourism.

However, the experience of regions of the North-West Federal District has shown that their efforts were concentrated on the development of regional inventories of intangible cultural heritages, which were run by regional cultural institutions.The preparation of the registers often precedes the enactment of regional law on intangible cultural heritage which could interpret it in a more holistic way (like Concept for the Preservation and Development of the Intangible Cultural Heritage of the Peoples of the Russian Federation for 2009–2015).

On the regional level the two notions of intangible heritage and traditional culture are addressed separately. It is the last idea of traditional culture that can appeal to the integrated approach calling for innovative cultural framework, analysis of federal and regional cultural heritage protection policy, implementation of regulatory instruments of UNESCO.

The extensive discussion on the Conception of Safeguarding and Exploitation of the cultural heritage in the Russian Arctic updated the problems of ratifying the Convention for the Safeguarding of the Intangible Cultural Heritage in Russia, nominating of new items, interpreted in more holistic way (Traditions of Northern reindeer husbandry) for the UNESCO intangible list and contributed to the integrated approach to the indigenous heritage.

Conclusion

The emergence of the concept of intangible cultural heritage and its inclusion in the international legal framework reflected not only a new, expanded understanding of culture, but also the efforts of indigenous peoples who united to protect and promote their rights at the international level. The concept of intangible heritage is currently associated with cultural rights, and the desire to highlight the cultural heritage of indigenous peoples, to which a holistic approach is applied is clearly manifested in the further development of the concept.

However a fragmented approach to the cultural heritage of indigenous peoples adopted by different UN agencies contribute to the simultaneous

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existence of the different ideas of intangible heritage and approaches for its conservation when it comes to the maintaining of indigenous rights.

A current dominance of regional approach to the further development of the measures for safeguarding intangible heritage determine the significant role of international cooperation on this issue. It places the indigenous peoples in national republics in a stronger positions.

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THE ASIAN ARCTIC IN THE 20TH CENTURY: PROJECTS AND PRACTICES OF INDUSTRIAL DEVELOPMENT IN SOVIET YAKUTIA

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The article outlines the Soviet strategy features and milestones of the Arctic territories' industrial development. There was undertaken a review of historiography devoted to the industrialization processes' impact on the state of traditional farming, the ethnical, demographic and cultural development of indigenous peoples in Soviet Yakutia. Two of the major 20th century social projects associated with the industrial development of Yakutia and directly affecting the livelihoods of indigenous peoples were identified and analyzed as examples. These are the massive transformation of collective farms into state farms and the implementation of the nomadism eliminating policy of the indigenous peoples of the North. It has been specified that, considering the changing patterns of relations between indigenous peoples and mining corporations over time, the Soviet historical experience (both positive and negative) seems to be very valuable in the view of the protection of indigenous peoples' rights and interests, leading traditional farming on lands rich in natural resources.

Keywords: industrial development, indigenous peoples, Arctic, traditional farming, ethno-cultural development, sedentarization.

One of the 20th century modernization processes' components was the involvement of the northern and Arctic territories in industrial turnover. Several strategies for the region development (Soviet, Canadian, American, etc.) were implemented in meeting the challenges of their industrial development. They are based on various conceptual approaches arising from the uniqueness of geographical, political, socio-economic, historical and cultural characteristics of a particular country. Industrial expansion was accompanied by the rejection of land, the destruction of the traditional farming ways basis and life support systems of the indigenous peoples of the North, and caused a number of socio-demographic deformations. However, if in the foreign North many negative processes have been commuted or compensated, then in the former USSR they have reached crisis, and often irreversible proportions. The full range of these problems was also focused in the Republic of Sakha (Yakutia), whose territory has been the object of intensive industrial development since the 20s of the last century.

In the implementation history of the large industrial and transport projects in Soviet Yakutia, their socio-economic and cultural consequences for

the indigenous rural population represents a specific layer. The importance of examining the impact of industrial development on the Asian Arctic indigenous peoples' livelihoods, including Yakutia, during the entire Soviet period is undeniable and mainstreamed by the current new wave of industrial and transport development of the Arctic. Nowadays, the attention to the humanitarian aspects, rational use of the past experience is an expected part of the responsibility of industrial structures operating in the republic.

The Russian Arctic industrial development process has received a fairly complete coverage in historiography. Among them, there are works devoted to the history of economic development of the country's northern territories at different stages and also addressing the issues of the history of state policy on the population formation and consolidation in industrial development areas of Siberia in the 1950s and 1980s, when the processes of industrialization and urbanization were actively taking place, which predetermined the fundamental socio-economic and demographic changes in the region. [Kiselev, 1964; Slavin, 1961, 1975; Timoshenko, 2009; Trajectories …, 2011; Russia in the Arctic …, 2017].

The perspective related to the natural and land resources utilization, the relations of industrial projects with the entire system of economy, including settlement and transport infrastructure, ethno-demographic and cultural development of indigenous peoples, has been and remains a field of wide interest for researchers around the world. The existing Russian historiography is built on a solid base created in the Soviet period by the works of such scientists as M. Sergeev [1955], I. Gurvich [1966], M. Budarin [1968], V. Zibarev [1968], V. Uvachan [1971, 1977], etc. Based on the materials of Yakutia, pioneer studies of the indigenous population's ethnosocial development in the conditions of industrialization were conducted back in the 1970s and 1980s by the sociological laboratory under the leadership of I. Argunov. The rich, collected and analyzed empirical material made it possible to identify the main stages of industrial expansion in the Yakut North [Argunov, 1985]. The indigenous population's integrating experience into the industrial world — into new social, ethno-cultural and demographic relations — was highlighted using a large range of historical and statistical data. The indigenous people opinion surveys undertaken at that time about the role and place of transport and industrial projects in their lives, their assessment of the industrial facilities' intrusion into the space of traditional management and the high migration influx of externally recruited labor are particularly valuable. The important areas of the development of Yakutia related to demographic and ethnosocial processes in the commodity republic have been developed for many years by the staff of this laboratory [Kuzmina, 1991; Fedorova, 1998; Bragina, 2005].

A significant number of works analyzing the Asian Arctic indigenous peoples' actual status, especially their demographic and ethno-cultural development under Soviet modernization were published in the post-Soviet period; some negative aspects in the state policy's history were announced, which caused irreversible changes in the indigenous peoples' way of life, mainly the indigenous minorities' of the North. The issues of preservation and traditional farming development of Yakut indigenous peoples under the modernization processes of the twentieth century is examined at different temporal materials [Kovlekov, 1992, 1993; Vinokurova, 1993, etc.]. The fundamentally important aspects of the history of the suppression of the interests of the natives of Yakutia with industrial projects are covered in the works of S. Boyakova [1995, 2001] and I. Vinokurov[1], this subject in various dimensions remains one of the most important for the regional historiography. The ethnic labor division metatheory was interpreted by Yakut sociologists from the perspective of the professional occupations' prestige for the indigenous population of Yakutia [Podoinitsina, 1995]. The main features of the labor resources of the republic, their cultural attitudes, relations to different types of employment and working conditions remain the traditional field of sociologists' and economists' research. [Donskoy, 202, 2004, 2006; Baisheva et al., 2012]. Not only regional and Russian, but also foreign researches are attracted to the commitment of indigenous peoples' representatives to agricultural labor, reindeer husbandry and fisheries, which is associated with living in rural areas and the traditional nature management preservation [Takakura, 2015; Filippova, Fondahl, Savvinova, 2020].

The industrial development of Yakutia was carried out in line with the general Soviet strategy for the Northern development, featuring: selective method of natural resources development; the operation of which was dictated by the needs of the all-Union economy and obtaining a rapid economic effect; preferential development of extractive industries in this regard; focal nature of development geographically local territories with the creation of many repair, technical services and supply structures; departmental approach to the natural resources' development, excluding interaction with local authorities, as well as between the departments themselves; focus on the use of externally attracted labor without creating a social infrastructure that formed the psychology of a temporary worker [Boyakova, 1995, p. 77]. This strategy provided a relatively fast pace of the Arctic's industrial development under off-road conditions, isolation from the industrially developed regions of the country, limited material and technical resources. However, it had

[1] Vinokurov I. 1994. Evenki of the zones of the Baikal-Amur highway: historical and demographic aspect (1976–1990): PhD abstract. Yakutsk. (In Russian)

one fundamental flaw — it was based on political and economic priorities that did not take into account the interests of peoples, which could not but lead to the social and ethno-cultural problems' aggravation in the region. Freed from the burden of paternalism towards the peoples of the North, the USSR government decided to include the indigenous population of the developing areas in its industrial policy. Describing this policy, there should be highlighted the following points. Firstly, the state at that time had a certain interest in supporting traditional sectors of the economy. If the fur trade was the most important source of foreign exchange earnings for the needs of defense and superindustrialization, then the rest of the industries were considered the basis for creating a food base for industrial and transport enterprises. Secondly, the indigenous Northerners in this policy were assigned the role of a supplier of food and horse-drawn transport, which played an exceptional role in transportation until the early 1960s. They also carried out a complex of preparatory (logging and construction) works. And, finally, some of the local youth were sent by the nearby collective farms to industrial facilities in the party-Komsomol order, thereby forming a brigade of the national proletariat. Thus, the indigenous population played an important role in the industrial development of the North. The focal nature of the development restrained its negative impact on the traditional way of life of indigenous peoples.

A new stage in the industrial development of northern territories of the USSR began at the end of the 1950s. Since that time, the process of intensive industrial development has commenced, covering a vast territory, including the Yakut ASSR. The certain scientific and technical potential accumulated by that time, the improvement of transport links, the possibility of attracting significant capital investments determined the broad scale and rapid pace of this development, entrusted to a number of union departments. Rampant industrial expansion and ruthless renewable and non-renewable natural resources exploitations had disrupted the ecological balance, undermined the foundations and way of life of the Northerners. Noting the industry's destructive impact on the natural environment affecting the conditions of existence of the northern peoples, A. I. Pika referred to them: the reindeer pastures and other fishing grounds exemption for the construction of industrial facilities; massive toxic and mechanical pollution of the aquatic environment, destruction of fishing grounds and fish spawning sites; concentrated deforestation; large-scale soil and flora disturbance of tundra and taiga as a result of disordered traffic; flooding of especially valuable, inhabited territories during the construction of hydroelectric power station; anthropogenic wildfires, poaching and increased recreational load on vast territories in industrial development areas. [Russian Arctic…, 1996, p. 112]. The sudden in-

flux of a large number of non-national population, the "migration draft", the national policy of the CPSU led to the traditional, spiritual and moral values' leveling, the substantial loss of the ethnic identity of the Arctic peoples.

As a certain result and assessment of the Russian North's soviet development stage, the results of sociological research conducted by one of the authors in the Kolyma group of districts of the Republic of Sakha (Yakutia) in 1991 can be brought. Back then almost half of the respondents, due to the environmental problems' aggravation, expressed the need for extraordinary measures at the Russian Federation and the Republic of Sakha (Yakutia) governmental level, 40 % had proposed the establishment of forbidden and conservation areas, 34 % — to suspend the activities of industrial enterprises that pollute the environment, and 20 % were in favour of holding off the industrial development of the North due to the fragility of northern nature[2] [Ivanova et al., 1992]. For comparison, in the similar survey among Alaska natives, 45 % of them said that the industrial development contributed to enhancing their living standards, 20 % — that because of industrialization, the indigenous traditional crafts introduced many technical innovations, and only a quarter of indigenous peoples identified the disruption of the ecological balance as a negative impact of industrialization [Podoinitsina, 1995, p. 127].

At the same time, the process of industrial development had other profound implications. It is necessary to single out twomost important, from our point of view, social projects of the 20th century in terms of their scale and impact, associated with industrial development and aimed at a direct impact on the indigenous peoples' livelihoods. Both are interconnected in terms of goals and socio-economic content: these are the reforms of the 1960s and 1970s in the agricultural sector of Yakutia with the all collective farms transformation into state farms and the state campaign to eliminate the nomadic lifestyle. Both programmes are focused on the industry organisation unification and its management, were attempts to eliminate the obvious gap in the level and quality of life between the "city and village", between the industrial and agricultural population.

In the second half of the twentieth century Yakutia was turning into the domestic diamond industry base, the extraction of gold, coal, and mica was growing. The acceleration of the industrial development pace caused population growth, an increase in the workers and employees' proportion in its social structure, increased the need for agricultural, especially perishable dairy and meat products of the agricultural sector. In the 1960s, there

[2] Ivanova T., Boyakova S., Danilova L. 1992. Socio-ecological problems of Kolyma river in connection with hydraulic engineering: research report. Yakutsk (In Russian).

were underway the preparations for the mass transfer of collective farms to state farms. The process of full agriculture nationalization was launched in the republic, in which there was only seven state farms in 1960, in 1965 — twenty-eight, and by 1974 all the collective farms of the republic, with the exception of the fishing artel "Arctic", were reorganised into state farms. The amount of state farms in the republic in 1975 was 71, and in the second half of the 1980s there were more than 120 [History of Yakutia, 2021, p. 403].

All transformations were accompanied by the administrative subordination changes, settlement structure, peoples' work/life organisation. In this regard, it's acceptable to talk about the stressful influence on the Yakut indigenous peoples' livelihoods, the social and cultural consequences of which have been actively debated for decades. The economic results of the collective farms elimination were also morbid, there were mostly collective responsibility and interest in high labor productivity, which were subsequently replaced by a general decline in production discipline [Vinokurova, 1993].

The consequences of the Arctic and Northern Yakutia regions' nomad settlement programmes' implementation turned out to be equally ambiguous. The sedentarization state campaign was launched back in the 1930s, but even in 1965, according to official data, in the Sakha Republic more than two thousand families continued to roam. The Council of the YASSR Ministers adopted a resolution "On measures to complete the transfer of the nomadic population to a sedentary lifestyle in the Yakut ASSR northern regions". The Yakut Regional Committee of the CPSU and the Council of the YASSR Ministers have repeatedly returned to the issues of transferring to the settlement the Northern indigenous minorities representatives of the republic, noting the need for urgent measures to lift the level and quality of their lives.

The staff of the SB RAS Institute for Humanities Research and Indigenous Studies of the North only in recent years has completed several projects to study the history of nomadic communities of Yakutia in the twentieth century [Vinokurova et al., 2019; Filippova et al., 2020]. In this regard, there have been used new approaches to study and comprehend the life of the Yakut nomads, and also has been applied the view formed in recent decades on northern nomadism as a significant ethno-cultural intrinsic value.

According to the researchers, the social sedentarization project was initially ambivalent, because with its goals of eliminating nomadism, it was planned to preserve reindeer husbandry as an economically profitable and necessary industry for the development of northern industrial settlements. Despite the almost complete nationalization of reindeer husbandry, the sedentarization of the Yakut nomads stretched for almost the entire second half of the twentieth century. It is indisputable that the process of forced sedentarization negatively affected the ethno-cultural development of nomads,

changing both the space of their life activity and their ethno-social well-being [Vinokurova, 2000; Filippova, 2007].

In this vein, it is significant that under the country's collapse condition in the 1990s, it was the return to traditional nomadism, to ethnic traditions of self-organisation and nature management that became the manifesto of the emerging social movement of indigenous peoples of the North in Yakutia [Grigoriev, 2020]. Taking into account the changing patterns of relations between indigenous peoples and mining corporations over time, the experience of the revival and functioning of tribal nomadic communities is valuable in the view of the indigenous peoples' rights and interests protection conducting traditional farming on lands rich in natural resources.

Currently, the northern and Arctic territories are again under intense scrutiny of the world community. The new intensive industrial development wave is primarily connected with the mineral resource base of the Arctic coast and shelf zones. While the most relevant projects again will be accompanied by the alienation of land for industrial development and related infrastructure and by projecting increase in the environmental and social burden on the territories and local communities.

In this regard, there are serious concerns about the indigenous peoples of the North, whose prospects in the context of the resource projects implementation in the Arctic are very ambiguous. Learning from the Soviet experience, comparing it with the undertaken policy and, most importantly, the practice of industrial development in the 1930s and 1980s will help in developing effective, primarily legislative, mechanisms for protecting and depreciating the negative consequences of the industrial development expansion for indigenous Northerners.

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METAGEOGRAPHY OF CULTURE: RUSSIAN CIVILIZATION AND THE NORTH EURASIAN DEVELOPMENT VECTOR

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The new term of "metageography of culture" is introduced and explained. The concept of metageograhy is explored with regard to various interpretations of geoculture. Issues of the emerging North Eurasian image are addressed in the context of geocultural development of the Russian civilization. Prospects of successful modernization for the Russian civilization closely correlate with imaginative geocultural development of Siberia, the Far East and the Arctic.

Keywords: metageography, culture, geoculture, geographical image, North Eurasia, Siberia, geo ideology, the Russian civilization.

Metageography of Culture. Imaginative Civilizational Strategy for Modernization

In terms of methodology, no discrimination is made between political, economic, social, cultural, or any other aspects of modernization. This is a comprehensive problem, the concept itself implying strong reference to emerging, developing, and overtaking time. There could be many times in fact, as many as there are human communities and civilizations with their reflexive processes of reproducing, adapting, appropriating, comprehending, and imagining time and its components. Yet modernization processes are not interpreted adequately unless matters of spatial imagination and spatial reflection are taken into account. Authentic times and spaces of civilizations are cornerstones of their self-reflection, determining their vital capacities and horizons.

Local civilizations undergoing recurrent modernizations and spatializations (i. e. comprehending and imagining their own land) have to design more and more new time and space patterns in response to both internal and external challenges (political, social, cultural, and etc.). Accordingly, every civilization appears as a strong or weak "radiant" of original space-time images, signs and symbols enabling it either to extend its influence or to balance the gradual loss of traditional domains. It is actually a matter of *image-civilizations* establishing, in our age of globalization, an unstable, changeable and "floating" mental field engaging the communications, symbioses, clashes and conflicts of different conceptions of civilisation.

Metageography is therefore seen as a cross-disciplinary framework organising knowledge in the fields of sciences, arts and philosophy to identify, establish and represent major space (geographical) patterns of each specific local civilization. Culture interpreted by P. Florensky as mainly the opening up and explaining space provides an immediate ontological basis for metageography. Consequently, *metageography of culture* is a strategic planning structure that transforms identified, created, and represented space-image sets of particular civilizations into consistent application strategies on social, governmental and regional levels.

An imaginative (iconic) modernization strategy implies a substantive and institutional organisation of cultural metageography for certain civilization, to devise special-purpose strategies in education, sciences, cultural institutions, cultural and political ideologies of long-term (metaphysical) effects, and to produce stable, authentic, and "competitive" images, signs, and symbols. Russia as a specific, comparatively young and yet unsteady civilization, with the ideology and image not quite "crystallized" to date, is sorely in need of this strategy. The imaginative civilizational strategy in Russia can lay down the ontological foundation not only for its survival as a civilization, but also for balanced development in cooperation with other local civilizations.

Geoculture and Metageography: Substantive Interaction

An *interpretation* as an investigation procedure generally requires positioning a subject of the investigation or a test objective in a broader research (cognitive) space, that is to say, in a broader and meaningful context. It is thus necessary to define the laws of development and the scope of this space framework originally viewed as substantive. This might be described as a way to define or "measure" the content level of major premises of the subject of the investigation or the test objective.

An *interpretation of geocultural (cultural-geographic) images* suggests passing to a meta-level as compared to representation processes (i. e. representations of social phenomena) where a single image field combines signs, symbols and stereotypes differing in genesis, structure and composition, and generating, in the course of the interpretation, serial patterns projected on a "perceptive screen". Culture in this case attracts a scientific interest as a product of imaginative geographical interpretations [Zamyatin, 2000].

Metageography: Subject and Method

Metageography is an interdisciplinary field of knowledge involving sciences, philosophy and arts (in a broader sense) and exploring various poten-

tials, conditions, modes and discourses of geographical thinking and imagination. Among the candidate synonyms for metageography are landscape philosophy, geophilosophy, space (site) philosophy, existential geography, geosophy or, in some cases, imagination geography, imaging (image-making) geography, geopoetics, space poetics. The concept of metageography is interpreted by analogy with Aristotelian distinction between physics and metaphysics, both in logics and content.

Rationalistic and scientific approaches only describe the subject of metageography in terms of general geographical laws. These started from general physical geography in the first part of the 20th century, although the original and fundamental principles taken as the metageographical ones today were proposed by German geographer Karl Ritter [Ritter, 1853, p. 353–556; Golovanov, 2008, p. 13, p. 7–16] in the early 19th century. An important contribution was made by classical geopolitics (late 19th and early 20th century) using the traditional map as a matter of metaphysical and geosophic speculation [Zamyatin, 2001, p. 97–116]. Interest in metageography within the frame of geographical science in the period between the 1950s and 1970s was enhanced with the advance of mathematical methods, the systems approach and various logic-mathematical models designed to explain and interpret more general geographical laws [Bunge, 1967; Gokhman et al., 1968; Harvey, 1974; Saushkin, 1973; Bachelard, 1998; Nikolaenko, 1982]. By late 20th and early 21st century the concept of metageography was criticized in terms of the traditional scientific paradigm focusing on case-studies, and almost restricted to peripheral discourse [Lewis et al., 1997]. Meanwhile, latent metageographical problem posing persists in modern studies of landscape images, geographical imagination, symbolic landscapes, or landscape/memory correlations [Schama, 1996; Soia, 1990; Tuan, 1990]. Philosophically, discursive potentials of metageography were defined by Martin Heidegger in the first part of the 20th century, in his early phenomenological version (the *Sein und Zeit* [Being and Time], 1927), as well as in subsequent existential work (essays written between the 1950s and 1960s, including the *Bauen Wohnen Denken* [Building, dwelling, thinking], *…dichterisch wohnet der Mensch* [Man's poetic housing], *Die Kunst und der Raum* [Art and Space), *Das Ding* [The Thing], etc.). [Heidegger, 1993; Heidegger, 1997; Heidegger, 2008, p. 176–190]. Metageography is also grounded on various phenomenological studies of space and place including, among other fundamental works, those by G. Bachelard in the 1940s and 1950s [Bachelard, 1998; Bachelard, 1999; Bachelard, 2000, p. 5–213]. Progress in semiotics, post-structuralism and post-modernism promoted philosophical interest in metageographical issues between late 1960s and 1980s (works by M. Foucault, G. Deleuze or P.-F. Guattari; introduction into philosophical discourse

of the concepts of heterotopy, geophilosophy, de-territorialization and re-territorialization) [Deleuze et al., 2007; Deleuze et al., 1998; Zamyatin, 1999; Zamyatin, 2008; Foucault, 2006, p. 191–205]. Finally, the vigorous globalization processes together with the conceptual "drift" of philosophy towards investigations in broader and interdisciplinary fields of knowledge by the late 20th and early 21st century stipulated metaphysical studies of terrestrial space [Nancy, 1999; Podoroga, 1995; Sloterdijk, 2007].

In the arts, metageographic issues *as such* were first addressed early in the 20th century in belletristic literature (by Proust M., Joyce J., Bely A., Kafka F., Khlebnikov V.), painting and theoretical manifests of the futurists, cubists and suprematists, and architectural design of F. L. Wright. This imaginative interpretation of terrestrial space paralleled a theoretical revolution in physics (relativity, quantum theory) and the advance of anthropogeography. The artistic and literary avant-garde (first represented by Kandinsky, Malevich, El Lisitsky, Klee, Platonov, Leonidov, Vvedensky, Harms, and then by Beckett) viewed and imagined space as existential ontology of man *per se*. The second surge of European avant-garde (1940–1960) actually reproduced initial positions without contributing any radical novelties. The principal trend was exploiting synthetic spatial experiments of Chinese and Japanese art in painting, graphic works, calligraphy, and poetry — among others, by Michot).

By the early 21st century, metageographic experiments and studies were generally restricted to imaginative literature, philosophy, and plastic arts, with scientific representation being unimportant. Metageography on the whole is characterized by amalgamation and coexistence of different textual traditions: imaginative, philosophic or scientific; an "essay" emerges as an important genre allowing free description and interpretation of metageographic issues [Golovanov, 2008; Zamyatin, 2004c; Rakhmatullin, 2002, p. 4–5; Rakhmatullin, 2008]. The rapid advance of new technologies (computer, video and the Internet) stimulates new metageographic representations and interpretations (matters of virtual spaces or hypertexts only indirectly relating to actual places or areas).

In terms of content, metageography deals with regularities and characteristics of mental dissociation from actual experience in perceiving and imagining terrestrial space. An essential element of this dissociation is analysis of the existential experience of various landscapes and places — both personal and that of others. In terms of axiomatics, metageography implies the existence of mental patterns, charts and images of "parallel" spaces accompanying images of reality sociologically dominating in each specific age. The growth and sociological domination of mass culture also promote down-to-earth, para-scientific versions of metageography (similar to those

of sacral geography) focusing on discovering and registering all kinds of "power spots", "mystic places", and the like.

With regard to ideology, metageography and specific metageographic experiments may effect artistic movements, scientific or philosophic trends, sociopolitical or sociocultural concepts of intellectual communities. Conceptually, metageography interacts substantively with humanitarian and cultural geography, geopoetics, art geography, geophilosophy, sacral geography, architecture, myth geography, geocultural studies, and various artistic and literary practices.

Towards a Key Element in a Metageography of Russia

The fundamental metageographic problem in Russia is formulated as follows: ideological inertia of ancient imaginative-geography sets "holding" the country to the west of the Urals and inhibiting mental dissociation from Europe. Accordingly, the principal metageographic challenge that Russia has been facing for almost four centuries is defined as a search for attractive and efficient ideological images of trans-Ural area, for a mental "turn" of the country eastward, towards Siberia, the Far East, Central Asia, and China. Of course, the strata built up in Russian civilization's European communications will remain as a basis for future civilizational and metageographic development, since the question is of an alternative new geo-ideological vector and trans-Ural transfer of the metageographic "centre of gravity".

Geographical Images of Siberia: Specificity of Formation and Development

Geographical images of Siberia as a generalized entirety arise from sustained retranslation of ideal images of European landscapes into original sense perceptions of trans-Ural landscapes. One can well understand that similar mental activities have been persistent, and quite vigorous, since the days of the great explorers, and that, in this case, Siberia is absolutely no different to Americas, Africa or South and South-East Asia colonized by West-Europe [Zemskov, 1995, p. 88–95; Zamyatin, 2003, p. 41–49; Zamyatin, 2004a, p. 136–142; Zamyatin, 2004b, p. 45–60]. However, having come to the Ural frontier and crossed the *Rock*, Russia began reproducing the images with a certain mental delay, arriving somewhat "late" in terms of history and geosophy, guided first by classical colonialist images with sacral-mythic and Bible-Christian implications, and then by more "profaned" patterns of prosaic West-European settlements as "islets of comfort" in the "ocean" of wild or little explored nature. So the first Russian wordy description of trans-Ural area, the 15th century *Tale of Strange Folks,* provides an evident

example of the first approach to be further developed in standard annals and ecclesiastical writing [Pliguzov, 1993], while Anton Chekhov's lapidary *Out of Siberia* gives a perfect idea of the second approach. Nevertheless, highly impressive images of cold, snowy, monotonous plains, the taiga, steppes and swamplands go with empty spaces and pagan savagery accompanied with mythical or real riches.

The mental-ideological retranslation in creating and reproducing geographical images of Siberia, a complementary spatial transaction due to the inter-civilizational position of Russia (remember that it was still the Moscow Kingdom in the 16th- and 17th century, generally dominated by byzantine mental and ideological standards of the sacral order and mainly of South-European and Middle-Eastern origin [Plukhanova, 1995; Bogdanov, 1995; Zymbursky, 2006], resulted in a significant introtroversion where images of Siberia could be and, in fact, were perceived (and, of course, reproduced regularly) as some "inherent" Asian images that European civilization needed to maintain mental balance to the east — Russia being both a geo-ideological "pupil" and an "agent" securing (even if in part) the "home delivery" of the mental product. It is wrong to regard this civilizational and metageographical situation as on the decline: the vast trans-Ural territories almost suddenly falling under the Moscow Kingdom's influence required adequate and well-grounded geographical images. These were successfully "imported" and adapted by Russian culture "recognizing" them as quite organic; the "Siberian Tartary" is not only the West-European but also the Russian image that was absolutely "functional" between the 16th and 18th century.

Metageography of Siberia as the "Collective Unconscious"

A mediator would sooner or later run the risk of facing an ambivalent image lacking external support and replenishment and thus becoming unruled and unpredictable. This is the case of the geographical images of Siberia appearing, to a certain extent, as a profound "unconscious" of Europe and the West at large on the East-Eurasian frontier, and, automatically, as Russia's "unconscious"[Grois, 2003][1]. Since the emergence of the American frontier as Siberia's foreign geo-ideological twin in the 19th century (the fact being admitted by the mid-19th century) [Zamyatin, 1998, p. 75–89], Europe wanted Siberia as a close-by peripheral resource, which was clear to the Russian political and cultural elite. This image is also considered in cognitive terms, generally as extravert and open to substantive development.

[1] To elaborate the well-known post-Freudian discourse of B. Grois on historiosophic and culturosophic ambivalence of West/Russia relations by analogy with C. Jung's depth psychology.

The birth and growth of Siberian regionalism was a "litmus test" for increasing substantial contradictions in the Siberian geographical image structure taking a shape within the integrated Russian civilization [Anisimov, 2005; Serebrennikov, 2004]. The discourse of "Siberian colonization" and declarations of allegedly resulting possibilities of Siberian cultural, even political and economic autonomy, represented a cognitive reaction to the mental bifurcation of key elements in the original geographic image of Siberia taken "here and now": introversive inertial elements indicated a closed, subsurface, self-isolated and yet serving obscure "mirror" needs of civilizational reflections; while extroversive accelerating elements being, in turn, continuously reproduced in the molds of Western fantasy[2]. Yet by mid19th century the civilizational context within the Europe — Russia, West — Russia dialogue framework differed from that in the 16th to 18th century. First, the West required no more geographic-image mediators, for mature modernity enjoined strategies of open political and economic, and civilizational expansion. And then, it was the age of definitive formation and establishment of Russian civilization capable, even while watching the West European reaction, of developing native ideological discourse, including metageographic.

The metageographic problem was formulated by analogy in terms of psychology as follows: extroversive images of colonization and frontier were insufficient for the "start", the radical transformation of the introversive images of Siberia developing rapidly for at least three or four hundred years, with Russia recognizing itself as an independent civilization actually deprived of European ideological support, automatic imitation of the frontier image of Western origin could not pay such evident cognitive-iconic "dividends" as did the retranslation of European images of Siberia at the dawn of mental interpretation of the region. Muscovy gave way, as did Siberia as a fairly efficient image within the Russian civilization. Intellectual efforts of Siberian regionalists, along with their appreciation among the various strata of society in Russia, demonstrated the cognitive inadequacy of this discourse,

[2] At greater length: Zamiatin D. Geocracy…; analysis of universal questions in the history and theory of Siberian regionalism, in: Alexeev V., Alexeeva E., Zubkov K., Poberezhnikov I. Asiatic Russia in geopolitical and geo-civilizational dynamics from the 16th to the 20th century. Moscow: Nauka Publ., 2004, pp. 411–448 (section on "Siberian regionalism: background and evolution" — K. Zubkov, M. Shilovsky.); also: Siberian regionalism: bibliogr. guide. Tomsk — Moscow: Vodolei Publ., 2002; Goriushkin L. The case of Siberia's secession from Russia, in: Otechestvo. Yearbook of local studies. Iss. 6. Moscow: Otechestvo Publ., 1995, pp. 66–84; Potanin G. A regionalistic trend in Siberia. Ibid. pp. 84–100; Svatikov S. Russia and Siberia. Ibid., pp. 100–113; www.oblastnichestvo.lib.tomsk.ru, and etc.

while the work of Siberian regionalists helped to elucidate the scope and nature of the challenge.

No important change was seen in the proven metageographical problem in the 20th century. Persistent attempts to reproduce resource-periphery frontier images of Siberia together with almost regular ideological invectives of either political or creative and philosophical character intended to emphasize the strategic importance of Siberia for the future of Russian civilization (including Soviet ideological versions) were at variance with each other and with in-depth introversive layers of the archetypal image[3]. Siberia actually appeared as Russia's "subconscious" but this mental situation is only comparatively favorable in the short run — no civilization can "roll" in the subconscious too long without risking a "health hazard" [Jung, 2008, p. 185–269]. In fact, the image of Siberia is still perfectly sustainable as a collective Eurasian interior symbolizing nature little exposed to man-made effects, terribly severe, staggeringly spacious and rich in unexplored resources — both for the Western civilization at large and for other civilizations modernizing in context of Western civilization pressure (Russia, China, India) [Zamyatin, 2008, p. 45–55].

Russian North-East Asia: Cognitive Models of the Development and Metageography

The undeniable fact is that the geographical image of the Russian North-East Asia (18th—19th centuries) could not be described and structured for a long time because of the poor geographical knowledge of this region, and in the power of unconditional amorphous of the imagery and geographical context. Within the dynamics of Russia's image, it was the far outskirts of Siberia, the waste lands in the European cognitive tradition, one way or another prevailed in the structures of representations of the educated social strata of Russian society. Japan, moving gradually to the North during the 17th—19th centuries, created, apparently, its own unoriginal geographic image of North-East Asia, and copied the Chinese worldview with a clear allocation of the cultural centre and the barbarian periphery [Kin, 1972; Isaeva 2000; Kryukov et al., 1987]. The imagery and geographical field of North-East Asia appeared in the original sense, obviously, only to the end of XIX — beginning of XX centuries, when the Russian (largely European) gradual image formation of the Far East [Zamyatin, 1999, p. 163–173] had made a progress, accelerated the processes of the autonomous structuring of geographical image of North-East Asia. It is apparent that Japan, quickly

[3] It could be a question of such different authors as Solzhenitzyn A., Astafiev V. or Rasputin V.

modernized in the second half of the 19th — early 20th century, also made a significant contribution to the development of this local cognitive-geographical situation, gradually changing initially 'Chinese' image of 'Northern territories' to a more Europeanized (including the cartographic tradition) image that implies quite naturally the existence of any other views about the region, in the context of other mental formations[4].

The geographic image of North-East Asia was formed, for the most part, as homogenous in terms of content, including orderly and structured picture of the region as a wild, barbaric outskirts of the Christian world in the biblical sense. As a consequence, the geographical image of North-East Asia for a relatively long time could not be regarded as, perhaps, an integral part of the image in the Asia-Pacific region (APR) — it was rather the image of the continental Interior of Asia, as if without the ocean (oceans) view; the image sealed in content and geographically. In other words, ethnographic and natural 'trace' of the region's image, manifested in the attempt of its traditional scientific and artistic (in the European sense) descriptions, had been for a long time (until the mid 20th century) a 'litmus test' of unformed clear and structured colonial or post-colonial discourses. Political demarcation between Russia (USSR), Japan, and the United States, held in this region during the 19th—20th centuries, had not made and could not have clarified this issue because, to a large extent, they were the product of larger political solutions based in the figurative sense on the Eurocentric world model. The political question of the Kuril Islands and Sakhalin state affiliation was resolved in this cognitive-geographical situation in the first half of the twentieth century — of course, referring to the geopolitical context of the I and II World Wars [Allison et al., 1997; Bogaturov, 1997][5] .

Considering the problems of North-East Asia's geographical images formation, it is impossible to avoid interpretation of these regions as cross-border [Zamyatin, 2000, p. 255–275; Zamyatin, 2001, p. 4–15; Zamyatin, 2002, p. 43–64]. Moreover, this interpretation contributes to a deep study of the revealed problems. In our understanding, cross-border region is a sizable (big) territory with a certain cultural-historical unity (the commonality of cultural and political history, cultural landscapes, and produced or reconstructed geographical images), and at the same time, concentrating, in this case, the maximum possible number of transitional zones in the de-

[4] See, for example, the New Edition of the Joint Compendium of Documents on the History of Demarcation between Russia and Japan. The Russian Foreign Ministry and Ministry of Foreign Affairs of Japan, 2001.

[5] Russian Kuril Islands: Past and Present. The Collection of Documents on History of the Russian-Japanese and Soviet-Japanese border formation. 2nd ed., ext. and amend. Moscow: Algoritm Publ., 2002.

velopment of significant and large-scale phenomena (cultural, political, and socio-economic). Along with this, the cross-border region is one of the largest geographical images, and such a great capacity is achieved through both a valid concentration of various phenomena in a certain area and the use of border crossings in forming of the most effective structure of the image itself. One can also find significance in the understanding of optional fixing in the general case, demarcation of the cross-border region as a geographical image in the traditional geographical coordinates on the modern physical or political map. For example, a geographical image of the Far East is represented and/or interpreted as the cross- border region in any political or cultural traditions can embrace geographically different parts of Russia, China, Japan, Korea, Mongolia, the United States, and possibly other countries. However, a more important aspect in image structure forming is the use of cultural, civilizational, political transitions, or otherwise fixed by this image (between traditional and modern cultures, between the spaces of Christianity and Buddhism, between industrial and postindustrial economies, and etc.). Due to processes of this mental processing and accumulation of various transitions, a kind of cognitive, or mental 'drift' of the image can take place in imagery and geographical field.

If you simulate a single imagery and geographical field in which there are both geo-referenced images of North-East Asia and the Asia-Pacific region (APR), a cognitive drift of the image of northeast Asia should be provided in the direction of the image APR. How can such cognitive drift be possible? It is possible in a situation of simultaneous targeted transformation of both images. Geographical image of North-East Asia is need to be positioned in this case as a broader, more capacious, and including, for example, from the viewpoint of traditional geography, the entire Northern part of the Pacific coast of Alaska, the Pacific coast of Canada, the Russian coast of the Arctic ocean; and from the viewpoint of substantial concentrations of various transitions including and processing, in particular, the problems of ethno-cultural interaction of Paleo-Asiatic peoples (the Chukchi, Aleuts, Ainu, and etc.) with the state-forming alien peoples. At the same time, the geographical image of the APR should be considered, undoubtedly, as a more 'southern' — from the viewpoint of traditional geographical maps; moving towards South East Asia, and subsequently, possibly, in the direction of Latin America (East and Southeast). Along with this, in a detailed structuring of the APR image, it is necessary to use the images of numerous cultural and civilizational transition zones (in particular, Christianity — Islam, world religion — the traditional cults and beliefs, the landscape values of the coastal and continental areas). The cognitive content of the proposed image transformations is maximum division, the distance of

nuclei in the considered images alongside with the apparent extension of the images themselves. The modeled imagery and geographic expansion should eventually lead to more intensive interaction of both images where one image (North East Asia) does not have to log into another (ATP) one; they can rather generate a certain cognitive-geographical continuum, intersecting in various meaningful aspects (cultural, political, and economic ones).

The Problem of Geo-Ideological Territory Creation: Posing the Question

If one structures in the mental attitude the basic concepts, describing the space images, produced and supported by the human communities at different hierarchical levels of different civilizational origin and localization, we can distinguish on the reference vertical axis, directed upwards (in the bottom — unconsciousness, at the top — consciousness) four layers (strata), forming a triangle (or pyramid, if you construct a three-dimensional diagram) placed on its base on the horizontal line. The lower, the longest horizontal strata, as if immersed in the unconsciousness, is the geographical images; a little higher 'locally mythological' strata is situated, less extended; even higher, closer to the level of a certain ideal of consciousness is the strata of regional identity; finally, at the very top is the 'cap' of space images triangle, the cultural landscapes are densely spaced, because of their dominant visuality to conscious representations and interpretations of different local communities and their individual representatives [Toporov, 1995; Russian Province: Myth—Text—Reality, 2000; Krivonos, 2001, p. 101–110; Abashev 2000; Luciy et al., 2003; Geopanorama of Russian Culture: the Province and its Local Texts, 2004].

It is clear that there are other schemas options that describe similar relations of these concepts. It is important to emphasize, however, that, on the one hand, various generating of original local or regional myths are largely based on geographical imagination and the process of development, local myth processing is, apparently, 'semi-conscious' or 'semi-unconscious' cognitive 'expansion' of certain geographical images, which are a kind of 'unconscious formation' for a given area or location. The ontological problem of the geographical images and local myths interaction — if you try to interpret the above scheme — most likely consists of how to try to form some imagery and geographic 'chain' in proposed (and possibly not very believable) sequence of the conventional imagery and a geographic 'mixture', not implying logically similar sequences (spatiality is as the availability, the urgency of the spaces whose images need no correspondence, neither in the hierarchy nor in the orientation/direction), and then parallel them in

correlation with them, and trying to tell a very specific local history, whose contents can be mythological [Zamyatin, 2005, p. 276–323]. In other words, a mental transition should happen in the transition from geographic to local myths and mythologies, a transition is just a local myth created as the gap between closed geographic images as cognitive-filling of imagery and geographic gaps with the respective legendary, fabulous, and folkloric narrative[6].

Metageographical analysis and interpretation include identification of the ideological component that binds the marked spatial representation. This ideological element can be called geoideology, which is understood as a system of symbolic representations, in which spatial representations of a specific territory become actual and subjected to a metaphorical 'sublimation'; in other words, geo-ideology makes certain spatial concepts 'hot', ready for broad and simplistic rhetorical use in different cultural and political contexts[7]. In addition, geo-ideology is intended to implement and to represent specific sacred contacts between Earth and the Sky, needed in one form or another as ancient (the necessity is obvious here) and modern societies as well as civilizations (in which this need may be latent, hidden, and sometimes badly perceived) [Zamyatin, 2009, p. 102–111]. With this purpose, different religious ideas, being prevalent in a certain area, can be used in geo-ideology, however, the meaning of such geo-ideological 'vertical' sacralization is broader and at the same time based on the religious sense: geo-ideological sacralization (possible in the profane forms) provides territories, areas, places with the possibility to obtain and use images of the internal or revelations, giving them a specific sacred or semi-sacred status [Zamyatin D. N. Local myths… p.14–16] .

How does the geo-ideological bond of levels in the spatial conception of territory happen? As a rule, it is carried out with the help of certain local texts and genii of the place, whose biography and certain deeds or works actualize all the levels of spatial representations. We can say that the local texts and the genius of the place, 'working' in different mental dimensions, however, perform the same function of cognitive insertion, linking all of the levels into the coherent whole, a kind of general existential 'fabric' of space.

What is more, a significant part of local texts may be either directly dedicated to actual geniuses of specified places, or indirectly contribute to the emergence of such genii. The local texts (which can also be biographies

[6] See a brilliant modern example of the Bozhovskiy Ural mythology development based on chthonic mountain images: Nikulin M. Stone. Mountain. Cave. Ekaterinburg: Bank of Cultural Information, 2002.

[7] We use here by analogy the division of cultures into the 'hot' and 'cold' ones introduced for the first time by C. Levi-Strauss.

/ hagiographies of the genii of the place — writers, artists, architects, filmmakers, artists, musicians, philosophers, public people, politicians, local historians, and etc.), and the genius of the place (represented as a kind of 'emanation' of the place at the same time when a place can 'emanate' a genius) can be represented and at the same time represent all or part of the described levels of spatial representations — for example, including only the cultural landscape and locally-mythological levels [Zamyatin, 2007, p. 271–273; Zamyatin, 2007, p. 14–23; Zamyatina et al., 2007, p. 62–87; Zamyatin, 2008, p. 75–87; Zamyatina, 2008, p. 362–373].

Northern Eurasia as the Basic Image-Archetype of Russia's Metageography

Basic civilizational attitudes towards Russia are, from my viewpoint, the conceptual consensus, consisting of three main provisions: Russia is a fairly self-contained civilization; Russia can be considered as a civilization-satellite of the European civilization, owing European civilization; Russia is quite imaginable as a civilization-state, in which the vast majority of possible socio-cultural and political-economic discourses are understood by being translated in the dominant ways of representation as a state, 'statist' or 'parastatist' [Russia as a Civilization: Stable and Changeable, 2007].

Based on the imagination of Russia's space in Russia is, of course, connected with the problems of European discourses on space imagination [Said, 2006; Noimann, 2004][8]; power and space images in Russia are united enough with typical representations and discourses of the state or parastate nature; finally, the main question of the imagination space of Russia is the following: how may the Russian civilization- state provide, establish, maintain rather autonomous imaginary-geographical discourses that identify its civilizational uniqueness, distancing it from other civilizations, and — legitimizing it as a communicative integrity in the world of civilizations?

What does it mean: to imagine Russia? Russia itself is not a meaningful imagery and geographical project for the various socio-cultural communities on its state territory or abroad. At the same time, Russia is not a massive symbolic construction, created on the basis of some common, generalized notions about its geography — the physical, economic, political, and cultural one.

To my mind, to imagine Russia means to imagine a 'recession', extension, various transformations, and the interaction of those geographical images, which are created, constructed, developed, and performed as ex-

[8] Empire: Images of Russia in the Eurasian Cultural Context. Sapporo: Slavic Research Center, Hokkaido University, 2008.

ceptions of the general geographical preconditions of Russia's idea; in other words, to imagine Russia means to fully pack, roll, and focus all possible exogenous geographical representation in a symbolic sense, and thereby try to generate, using 'creative compression' and maybe 'imagery and geographical explosion', new imagery and geographical discourses, not taking into account their genesis and development of the existence of each other — they coexist, they 'see' each other, but only in the space that they create with their own 'recession' from each other, its own indestructible and irrevocable metaspaced cross-cutting approach.

What is the mental 'mark' that will help us to detect such imagery and geographical 'recession' and therefore, somehow, to try to imagine Russia?

We can rely in this case on the concept and image of the Northern Eurasia: the Northern Eurasia is 'legalized' as the concept by the traditional geographic patterns and map projection of the world vision; geographical image as an image of Northern Eurasia is still half-empty reflection of quite westernized and one-sided, unidirectional symbolic structures designed to somehow describe tabula rasa of indigenous peoples whose geographical images are practically either unrepresented or unrepresented in the framework of external communicative discourses [Zamyatin, 2004, p. 136–142; Slezkin, 2007].

However, we are not talking about how to fill simply in some empty 'shaped box' having been misused and marking the conditional and non-dimensional geographical space. We should talk about images of Russia's geography — when they can be represented and can develop as an independent mental field — as well as be 'concerned' about the Northern Eurasia as a potential mental space of local mythologies and mythological constructs of the syncretic kind and 'purpose'. At the same time, the Northern Eurasia can be very organic, comprehensive cognitive-geographical structure as well as context for many imaginative geographies developing their 'northern' and 'Eurasian' as quite some ontological characteristics — without any risk to get into the 'Procrustean bed' of the famous Russia-Eurasia's image taking place during the 1920–1930s.

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Chapter 2
GEO-ECONOMIC REALITY AND SOLIDARITY-BASED ECONOMY CASE

JUSTIFICATION OF POLITICAL DECISIONS ABOUT INDIGENOUS COMMUNITIES' RESETTLEMENT IN THE RUSSIAN ARCTIC

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The paper describes the reasons and rationale behind relocation of indigenous communities inhabiting remote and sparsely dispersed small settlements in the Yamal area of the Russian Arctic. Resettlement is mostly development-induced and often causes foreseeable, irreparable harm to the cultures and traditional life of indigenous peoples. In line with international documents and national regulatory frameworks the indigenous peoples whose traditional, economic, and social practices are based on the land from which they are dislocated are involved in the decision-making process. Such decisions are usually taken by public authorities and justification is based on standard sociological methods, in particular surveys, remaining the basic source of primary information about the willingness and perceptions of indigenous peoples about their resettlement. The findings of the authors are about more careful interpretation of survey answers and the necessity to use indigenous-centreed approach which can dispose traditional values of indigenous peoples and their attitudes towards their traditional territories. On the case of Shuryshkarsky District (Yamal, Russia) the paper demonstrates possibilities for resettlement decisions to become more responsive and culturally appropriate and accents the need of balanced interpretation of divergent backgrounds indented to make Russian indigenous legislation and public policy less authoritative and more in line with global trends.

Keywords: indigenous peoples, Russian Arctic, resettlement, decision-making process, justification

Introduction

Indigenous peoples have inhabited the Arctic for thousands of years. The proportion of indigenous peoples is estimated to be about 10 percent of the total population living in the Arctic areas. There are over 47 indigenous groups living in the Russian Arctic[1].

According to the 2010 All-Russian Census of Population 18 indigenous peoples live in the Arctic zone of the Russian Federation, namely from west to east: Sami, Veps, Nenets, Khanty, Mansi, Selkups, Enets, Nganasans, Kets, Dolgans, Evenks, Evens (Lamuts), Yukaghirs, Kereks, Koryaks, Chuvans, Chukchi, Eskimos, the total number is 197835 people [Detter, 2021].

The northern indigenous people are bearers of valuable and unique knowledge about the Arctic and possess traditional values, culture and skills[2]. The importance of indigenous peoples, their traditional knowledge and skills for Arctic sustainable development, conservation of vital biological and natural resources is being widely recognized. Indigenous peoples all over the world enjoy specific rights protected not only because this provides security for historically exploited groups but also because these people help the global fights against climate change and biodiversity loss[3].

On the other hand, the Arctic is one of the main resource-rich regions on the planet, and extractive activities are on the rise in all Arctic countries. Prioritizing the industrial development in the Arctic, the governments should be aware that the Arctic is primarily the home and area of life, economic and cultural well-being of indigenous peoples who have lived there for a very long time [Gladun,Chebotarev, 2015]. Industrial development, large infrastructure projects can have serious negative impact on indigenous peoples and their societies, including increased settler population on their lands, decreased local flora and fauna, contamination of water, soil and air, and degradation of valuable lands. This often leads to an increased risk of health problems among indigenous peoples, and to loss of or damage to

[1] IWGIA, 2021. The Indigenous World 2021: Russian Federation — IWGIA — International Work Group for Indigenous Affairs. https://www.iwgia.org/en/russia/4246-iw-2021-russian-federation.html (accessed: 05.01.2022).

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[3] Umoja wa Mataifa (n. d.). Protect indigenous people's land rights and the whole world will benefit, UN forum declares. Retrieved November 24, 2021. https://www.un.org/sw/desa/protect-indigenous-people's-land-rights-and-whole-world-will-benefit-un-forum (accessed: 05.01.2022).

hunting grounds, fisheries, biodiversity, medical plants and spiritual sites, among others [Fjellheim, Henriksen, 2006].

Facing various rapid and stressful changes involving climate change, socioeconomic pressures associated with globalization[4] and political struggles in the Arctic the indigenous peoples have felt a need to safeguard their culture and traditional way of life. In their efforts to be resilient indigenous peoples are supported by global community issuing a variety of international declarations and conventions, as well as by national policy, laws and governmental programmes. In many cases such support implies resettlement processes.

Development-induced resettlement or displacement based on other grounds often causes foreseeable, irreparable harm to the cultures and traditional life of indigenous peoples whose traditional, economic, and social practices are based on the land from which they are dislocated. Displacement often results in disintegration of local cultures, the weakening of community institutions and social networks, and the dispersion of kin groups. In addition, the conditions of the new locations are often followed by cultural destruction or imperil the physical survival of relocated populations[5].

In this realm, the objective of our paper is to describe the rationale and grounds for forced resettlements of indigenous communities based on the case of Yamal Region (Russia). The paper brings a very controversial issue of the right to cultural integrity as protected under international and national documents contradicting with the rights to enjoy national living standards and well-being prescribed both by national governments and international law.

The research question as formulated by the authors is whether forced resettlements of the Arctic indigenous population can be justified.

Methods and Results

Our research includes analysis of governmental policies and objectives stated in legal frameworks governing livelihood of indigenous peoples in the Yamal Region, as well as world trends and global context described in literature and international documents. Research methodology employs anthropological methods, comparative analysis. Cooperation with authorities and local government allows authors to access large amounts of quantitative information and, accordingly, use natural science empirical methods. Inter-

[4] The Arctic Human Development Report. Reykjavík, 2004.

[5] Roos S. 2002. Development Genocide and Ethnocide. *Human Rights Bief* 9 (3): 14–17. https://paperzz.com/doc/8107491/development-genocide-and-ethnocide (accessed: 05.01.2022).

action with the indigenous peoples of Yamal is carried out mainly on expeditions to the places of their traditional residence. Expeditions and standard sociological methods, in particular surveys, remain the basic source of primary information.

The main method employed for this paper is a survey data collection conducted in February-March 2020 in 17 settlements with 176 respondents. The reference group was indigenous peoples residing in the small villages of Shuryshkarsky District (Yamal). Questions were asked on their places of residence, occupations, family composition, quality of housing and infrastructure, availability of medical and educational services. The respondents were asked about their willingness to stay or to leave their settlements; the preferred places of destination, the reasons for moving or staying. Some questions were asked on possible governmental support like provision of new housing, employment assistance.

The methodology is based on direct interaction with the indigenous communities residing in small settlements. Hermeneutic analysis was applied to analyze cultural phenomena that remained unchanged during the period of industrial development and retained the inherited values of the northern indigenous peoples. We use hermeneutic analysis to interpret survey answers as well as folklore texts, arts, fairy tales, rituals and the patterns of indigenous peoples' economic activities. Our analysis results dispose basic traditional values of indigenous peoples in the Russian Arctic and their attitudes towards staying or leaving their traditional territories.

The main result gained from the research is that in Russia the vital decisions related to life and well-being of indigenous peoples are justified in the context of paternalism policies while the global agenda has turned to postcolonial discourse. The paper proves that in developing Arctic societies all political decisions should be carefully balanced relatively to cultural specifics of indigenous peoples and to consolidated political and economic agenda when indigenous peoples are disposed to irreversible changes forcing them to assimilate to new socio-economic patterns.

Background: Shuryshkarsky Case, 2020

Shuryshkarsky district is home to 4,900 indigenous peoples (Khanty, Nenets, Mansi). The indigenous peoples have certain specifics. They occupy remote territories, villages and settlements are sparsely spread with insufficient road and air transportation conditions. Certain groups of indigenous population still preserve nomadic or semi-nomadic lifestyle based on reindeer breeding [Gladun & Ivanova, 2017]and migrate long distances, moving with reindeer herds from northern tundra pastures in summer to the more

protected subarctic taiga in winter [Chance & Andreeva, 1995]. It is important to note that in spite of rapidly intensifying industrial, socio-economic and environmental pressures in recent decades, the region continues to experience a growing number of households and growing numbers of herded reindeer [Kumpula et al., 2012]. Moreover, traditional economies (often referred as ethno-economies) have undergone many changes and provided for entrepreneurial activity and formation of human capital (employment, growth of indigenous population) in extreme Arctic territories [Detter, 2019].

The socio-economic policy of Russia focuses mostly on the exploration of energy resources in the northern Arctic territories and the development of the Arctic transportation infrastructure[6]. Much more than benefits the indigenous peoples of the Russian Arctic face threats from intensive mineral, oil, and gas development, and conflicts caused by intensive industrial development model. Climate change, industrialization and environmental degradation have affected all aspects of their life [Gladun, Ivanova, 2017].

Indigenous peoples in Russia have gained constitutional and legislative support: the Russian Constitution guarantees the rights of indigenous peoples "in accordance with generally recognized principles and norms of international law"[7], and shares the responsibility between federal and regional governments for "the protection of traditional living habitat and of traditional way of life of small ethnic communities"[8]. Under Article 72 of the Constitution of Russian Federation the Federal Government has responsibility and jurisdiction to regulate and protect the rights of indigenous peoples, and the regions of the Russian Federation must bring their laws into conformity with federal legal framework. One of the crucial issues is the need to relocate indigenous communities due to low quality of life determined by the state and implemented as the guarantee of constitutional rights to life, to human dignity, to healthy environment, to social security, to health protection, to education.

Our case describes 17 small settlements in the Yamal peninsula where 419 people are residents. Among those, 238 are people of working-age, 68 retired persons, 113 children. The socio-economic characteristics of the settlements include low transport accessibility, lack of centralized heating,

[6] Foundations of Russian Federation Policy in the Arctic until 2035: official text: as of 2020. https://base.garant.ru/73706526/; Burgess P. 2010. Foundations of the Russian Federation's State Policy in the Arctic Until 2020 and Beyond. hhtp://icr.arcticportal.org (accessed: 12.12.2013).

[7] The Constitution of the Russian Federation: official text: as of 2022. http://www.constitution.ru/en/10003000-01.htm (accessed: 05.01.2022).

[8] Ibid.

water supply, sewerage and treatment facilities, and centralized power supply available only in 8 out of 17 settlements. Educational organisations and social protection system in these territories are also absent. The housing stock is represented by 162 wooden dwellings, 141 of which do not have property title. These characteristics classify the region as problematic and uninhabitable. From the governmental point of view the settlements should be relocated.

To make a decision on the current situation in the winter of 2020, the government bodies of the Yamalo-Nenets Autonomous Regionsponsored the research project aimed at receiving the opinion and prior consent of indigenous communities for resettlement. The research (several field trips and a survey) was conducted by the Arctic Research Centre. Public opinion was found through a survey and interviews of 176 persons out of 306 registered over 18 years old (99 men and 77 women) living in 17 settlements. Ethnic composition: Khanty — 161, Nenets — 1, Russians — 12, Komi — 2. Generally, the public opinion was represented by 58 % of population. Of those, 47 % of respondents do not want to be resettled (80 out of 173), 28 % (49 out of 173) want to leave at the earliest opportunity, 12 % (21 out of 173) would like to stay at their settlements for a long time and then leave, 7 % (13 out of 173) would like to leave in a year or two, 6 % (10 out of 173) found it difficult to answer.

The main reasons why residents would not want to leave: "this is my homeland" (93 answers), "traditional activities' (60 answers), the place to retreat and rest" (48 answers), vegetable garden (30 answers), availability of work and home (30 answers).

The key question in the study was whether the respondents plan to return to their community at least from time to time. 166 people out of 176 answered positively (94%). This shows the political and social risks of the population discontent in case of the villages resettlement. This fact should be considered when feasibility of territorial transformations is determined.

There might be several reasons for a possible return, and all of them require careful consideration. The first reason is that the residents of emptying settlements consider their places of residence as "ancestral territories". The residents of the district are characterized by a high degree of social rootedness. The second reason is illegal hunting and fishing which in local communities is often considered as "economic basis".

Based on the obtained data, the initial conclusions were made:

- living conditions in small settlements do not meet the requirements set in national standards;
- state and municipal services, life-supporting infrastructure are inaccessible for residents;

- environmental situation is dangerous and certain threats and risks both of anthropogenic and natural background exist;
- cultural, historical and natural heritage is endangered;
- the settlements do not demonstrate socio-economic potential and cannot be governed efficiently.

According to the public authorities' standpoint, resettlement is the only feasible solution to permanently protect the inhabitants of those communities.

However, the first conclusions made on the research conducted in the "paternalistic" manner differ considerably from the conclusions brought further from the research done across postcolonial context (in 2021) and with new methodologies and methods combinations applied. The postcolonial discourse allows to see the situation differently, to get closer to the point of view, ideas and expectations of people living in small settlements permanently or temporarily.

The background, customs and perceptions of the impacted indigenous communities have not been taken into account on the first stage of the research process. Meanwhile, even in cases when the opinion is correctly expressed and legally considered, the motivations and responds of indigenous peoples may be interpreted differently and serve as justification for totally opposing decisions. Such contradictory decisions are even more aggravated in the issues related to the quality of life and improving of well-being objectives targeted by the governments.

For example, unregistered property in small settlements can be a key factor in making decisions or implementing measures by governmental authorities in justifying resettlement. On the other hand, property title and ownership rights as well as living conditions and infrastructure are not considered a serious reason for resettlement by indigenous peoples. Seasonal living in premises for indigenous peoples is a part of their traditional way of life and is associated with presence at ancestral lands. For them, houses do not belong to someone personally, but to a family. Until now, residents of camps and settlements spend part of their time on lands where they are engaged in traditional activities: fishing, hunting, and gathering wild plants. The rest part of the year they are migrating in tundra with reindeer herds. Arctic indigenous people see themselves as belonging to the land rather than owning the land[9].

[9] Tsosie R. 1996. Tribal Environmental Policy in an Era of Self-Determination: The Role of Ethics, Economics, and Traditional Ecological Knowledge. https://papers.ssrn.com/abstract=1401579.

The attitudes towards natural environment are also different in indigenous and non-indigenous communities. Indigenous peoples in Yamal chose such types of economic activities that are appropriating "gifts of nature" — hunting, fishing, gathering, reindeer herding — rather than altering the natural environment. They did not take up industrial production and agriculture, instead, they chose the most optimal methods of farming based on a balance with the territory's capabilities. The complexity, extensiveness and appropriating nature of their economy is explained by the peculiarities of the Arctic nature. For many centuries in the harsh Arctic latitudes, the Yamal indigenous peoples have developed effective tools for sustainable development based on a careful attitude towards nature [Gladun & Zakharova, 2020]. Their life-support system is closely linked to traditional lands and land use, to the challenging climate and geography conditions — severe weather, limited natural resources, and dispersed settlements. Indigenous peoples are embedded in Arctic ecosystems, and even when degradation of natural systems happen, they found inner resources and tools top become resilient. Environmental problems do not discourage them form inhabiting the affected territories as the duty to take care of the environment for the benefit of future generations is fundamental to the Arctic indigenous worldview [Zimmerman, 2005].

Living on their ancestor lands and being engaged in traditional activities indigenous peoples preserve their national identity and traditional knowledge correlated with religious beliefs, social traditions and language. Their cultural heritage includes sites, structures, sacred places and remains of archaeological, architectural, historical, religious, spiritual, cultural, ecological or aesthetic value or significance. If their communities and lands remain pristine and undeveloped, they never become endangered since cultural and spiritual objects are protected by indigenous peoples in their historically and religious-based manner. Contrarily, when it comes to protecting sacred spaces and cultural objects, indigenous peoples are challenged by outdated laws and a misunderstanding of their cultural and religious practices. In developing Arctic territories, the values, belief systems, customary laws, languages, customs, social organisation and traditions of the indigenous peoples are affected and, in this way, need special protection.

Socio-economic potential of the territory is one more issue of misunderstanding and wrong interpretation. While in governmental standards small settlements are unfeasible and cannot be governed effectively, for indigenous peoples' small population size does not indicate either under-development or inherent population decline. On the contrary, for their specific geographic environment and economy type, a small population size represents an optimal solution [Gumilev, Kurkchi, 1989]. In small groups the

indigenous peoples can easily respond to major climatic and environmental changes by altering group sizes, migrating, and being flexible with seasonal cycles in hunting or employment [Park, 2008].

From indigenous-centered perspective scheduled employment ('working hours', allocated work responsibilities) is also inappropriate. The daily routine of indigenous peoples is a part of the interconnections within the universe. Khanty and Nenets do not plan ahead and their days are scheduled according to the weather. If a hunter gets up in the morning and does not feel like leaving the house, he follows his feelings and decides to do household chores reasoning that on such a day the game does not fly, the animal rests, the fish does not appear. In an integrated economy, everyone is engaged in very simple and efficient activities without any specialization in order to provide themselves with everything necessary for life. The household is organised rationally — big families can share a small space without disturbing each other. All things are multifunctional, for example, in the reindeer camp there are only necessities that can be quickly picked up and packed. In this perspective, indigenous community-managed programmes and organisations can work more effectively in small settlements [Gladun & Zakharova, 2020].

Discussion

Many researchers state that sustainability and cultural-centered approach are intertwined. Commitment to sustainable development agendas should therefore be a rational choice based on cultural and ethical reasoning, with the understanding that ethical behavior of certain cultural groups is closely connected to the welfare of society as a whole [Chen, 2012]. Sustainability refers to a moral way of acting [Grear, 2011], in which the person or group intends to avoid harmful effects on the environmental, social and economic domains, consistent with a harmonious relationship between those domains [Bañon Gomis et al., 2011].

In Russia, the regional governments are obligated to take measures for protection of indigenous peoples and for preventing the destruction of their communities and traditional way of life[10]. Preserving traditional way of life of northern indigenous peoples, guaranteeing their rights and interests in the process of territorial development, as well as involving indigenous communities in state affairs are the most important goals of the Russian Federation. For example, in the Strategy for Spatial Development of the Russian Federation for the period until 2025 (enacted in 2019), the principles

[10] On Guarantees of Rights of Indigenous Peoples in the Russian Federation: official text: as of 1999.

of spatial development include consideration of ethnocultural factor and, above all, taking into account interests and opinions of local communities and business in socio-economic development and planning of territories.

In the described case Yamal official authorities demonstrated the adherence to constitutional and international principles and rules guarantying the rights of indigenous peoples, for example on prior consent and expressed opinion. However, it is important how the results of opinion expression are interpreted and what rationale underlie the decision. Our study demonstrates that indigenous opinion is interpreted from the "authoritative" position. If contoured by postcolonial approach [Bhabha, 2003] it is emphasized that culture and cultural differences must be recognized, understood and addressed in any context. This is not to say that the quality of life is not an important consideration in any country's socio-legal discourse or that improving indigenous well-being shouldn't be an objective of the state policy. However, we face a certain level of misunderstandings of the research results leading to constant communication breakdown among governments and indigenous communities and to long stalls in development processes.

Indigenous peoples are diverse and distinct from non-indigenous cultures [Newcomb, 2005] with their thriving economies that rivaled the efficiency and success of more developing economies. Understanding the background and history of communication amongst nations and indigenous groups is critical to successful communication [Sciullo, 2008].

In Russia, the idea of a strong state has always been interrelated with the idea of paternalism, which has been understood as the responsibility and obligation of a welfare state to take care of "minor", peripheral communities. In Russian research literature it is contrasted to colonization and represented as a concern for ensuring conditions for implementation of social equality principle, for the preservation and development of guaranteed measures to protect rights in terms of managing the affairs of the state and society for categories of the population and ethnic groups, due to objective circumstances in a difficult socio-economic situation. As the historical experience of Russia has showed, it was precisely this concept of relations between the state and local communities that determined the peculiarities of Russian politics, which presents us with the opportunity to assert higher standards of ensuring their rights.

However, in implementing the policy of state paternalism, indigenous peoples were not considered as equal partners. Paternalism can be described as an ideology with a strong governmental concern about the development of small ethnic communities providing social support and improving the living conditions of indigenous peoples like housing, infrastructure, fuel and equipment for traditional activities, power supplies, clothing, footwear

as well as compensation payments and educational opportunities (secondary schools and boarding schools), etc.

There is a gap in scientific and methodological foundations to implement these objectives. Indigenous communities and territories in Russia are still studied and discussed in discourse centre domination and peripheral deficiency. This approach can be designated as "colonial" [Hardt & Negri, 2009; Wallerstein, 1974]. This becomes the main reason for aboriginal societies' distancing from the centre. This policy was justified by the idea that the centre had a progressive, beneficial influence on the periphery. A similar situation exists to this day in indigenous policies: all strategic documents are developed by the central authorities and framed by the federal bodies. Governmental policies and decisions are formulated without a consent of and even discussion with local communities; their values, attitudes, interests and ideas are not considered. Contrariwise, some postcolonial studies and citizen participation institutions count on periphery "voice" to bigger extent [Tlostanova et al., 2009]. Indigenous communities must be heard and understood more clearly and their perceptions and attitudes about their health, wellbeing, their lands' development and global processes, should be heard and taken into account, even if they are different from ideas of the centre.

Postcolonial discourse admits plurality of ontologies to exist and advocates for importance of these ontologies which makes possible to interpret interests, values, and expectations of local communities [Bhabha, 1994; Kopenawa, Albert, 2013].

Even when the decisions are taken after the consultation with local communities and after their contest is officially perceived, it becomes obvious that interpretation of the results based on common methods of contest perceiving are not unquestionable. A constant disregard for peripheral communities' interests lead to their passivity and expectation of centre leadership, strengthening the central stakeholders' belief in their intellectual and political superiority.

Recognizing an indigenous history, identity, personal beliefs and attitudes is also important in any process of consent perceiving and decision-making. We should not position indigenous peoples as "the problem," rather the national legal system itself or its certain elements can be an obstacle to provide justification and reasoning for decisions.

Governmental bodies and other representatives of non-indigenous communities might learn about Indigenous cultural values. Attempting to understand (however imperfect that understanding might be) indigenous peoples' perspectives and cultural values is important for state policy to be able to appropriately contextualize disputes that arise involving indigenous rights and the tools for their guarantying [Manley-Casimir, 2019].

Moreover, indigenous values can serve as guiding principles and provide a basis for the decision-making process, helping to shape society's attitudes towards the Arctic and adhere to current trends of careful use of its natural lands and territories as well as the interests of local people. Today, indigenous traditions and culture imply huge potential to develop policy and legislation.

Conclusion

When planning actions that affect members of indigenous communities, states must pay primary attention to the sustainability of the indigenous culture and way of life and to effective involvement of members of indigenous communities in decision-making processes that affect them [Roos, 2002]. Thus, community resettlement, on the one hand, may be considered as immediate and permanent solution to protect people facing adverse impact of recent development, on the other it can become the reason for social and cultural degradation and loss of cultural integrity.

In general, all Arctic states should try to ensure that the economic interests of the industrial development of the Arctic territories do not get priority over the interests of indigenous peoples who want to preserve their territories of traditional lifestyle and to use the Arctic lands and resources for their sustainable development. These interests must be mutual, and their combination should be provided by governments through the recognition of international principles and standards (such as participation, free, prior and informed consent, co-management [Gladun, Chebotarev, 2015]. National, regional and local authorities in conjunction with indigenous peoples and their cultural background must make every effort to save the Arctic as the home of the northern indigenous peoples.

As the value of traditional attitudes for living in the Arctic becomes increasingly important, there is a growing need for the academic and legal spheres to consider their methods of studying indigenous communities. This includes developing measures to hold those who engage with traditional knowledge accountable to non-indigenous communities and their cultures. Existing domestic and international law has the potential to protect and foster traditional values and knowledge, contributing to global efforts of sustainable development, indigenous communities' vision of the future and well-being in the Arctic.

The Shuryshkarsky district case demonstrates that communication gap has prevented a full and open conversation about quality of life, well-being and expectations of indigenous communities on how their well-being should be understood. Our paper is intended to find a path for public

policy to become more responsive and culturally appropriate [Crepelle, 2018] and to accent the need of balanced interpretation of divergent backgrounds which is indented to make Russian indigenous legislation and public policy less authoritative and more in line with global trends.

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VECTOR OF THE LOCAL AND REGIONAL INITIATIVES OF ARCTIC RESIDENTS

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The research is aimed at investigating the vector of Arctic residents' social activities on the example of the online initiatives at the internet platform Russian Social Initiative. It has developed some new classifications and applied SDG classification to reach the research goals. The suggested analytical technique provides meaningful analysis for governmental policy and decision making through better understanding of the content and the vector of the social activity, including its compliance with sustainable development goals. It is also an effective reflective instrument that increases the effectiveness of participatory management in the context of reaching sustainable development goals in Arctic cities and settlements.

Keywords: Russian Social Initiative, online initiatives, social activity, arctic citizens.

Introduction

The Arctic areas today are at the forefront of modern socio-economic transformations and are of key importance for national security[1]. Arctic is a territory with a special ecological and socio-economic "status" for many objective reasons: a high level of environmental vulnerability, indigenous peoples' rights and cultural heritage, difficult conditions for the development of infrastructure and mining, etc. Besides, the world crisis of sustainable development increased common attention to the ecologically vulnerable Arctic which has great importance to the world environmental balance [Pilyasov, 2015].

The Arctic is characterized by a low population density, remoteness from the "central" territories. The general trends for the world Arctic zone are the age and sex imbalance of the population[Jensen et al., 2014], which causes an even greater decrease in the population density in this area [Martin, 2009] and negatively affects the rate of its socio-economic development. The stability and growth of the Arctic population level are critical factors for the long-term survival of the Arctic communities [Zonn et al., 2016]. The viability of the Arctic territories is also largely determined by socio-psychological factors: the level of leadership potential of residents, their cohesion, unification to achieve common goals, the development of

[1] Strategy for the development of the Arctic zone of the Russian Federation and ensuring national security for the period up to 2035: official text: as of 2020. URL: https://www.garant.ru/products/ipo/prime/doc/74710556/ (accessed: 07.01.2022).

social relations and ties, social unity [Skerratt, 2011], the ability to "find sources of income and the meaning of existence" [Zonn et al., 2016, p. 139]. The level of viability of the territory increases in the process of joint activities of socially active citizens and organisations ready to take responsibility for the fate of the city and be actively involved in solving local issues [Nuikina, 2015, p. 157].Thus, the intensification of the participation of Arctic residents in the planning the strategy and ways of Arctic socio-economic development is a systemic strategic factor in improving long-term and sustainable prosperity and well-being of the Arctic inhabitants and also is one of the basic conditions for the successful implementation of the national programme for the Arctic strategic development. Nevertheless, there is a lack of research investigating the role of social initiatives and innovations in the sustainable development of territories [Mair & Martí, 2006; Rahdari et al., 2016; Sekliuckiene & Kisielius, 2015].

In the previous research, we revealed that Arctic citizens generated a sufficient number of rational initiatives [Ljovkina &Detter, 2021] but the focus of these initiatives stayed unclear. The purpose of this research is to clarify it with the help of suggested analytical technology, including a new classification system for online initiatives. It will allow a better understanding of the existing level and vector of participatory management in the Russian Arctic and perspectives of its further development opportunities.

Method and Data

We used the open database of the initiatives at the Russian Social Initiative (RSI) internet portal considering only local and regional initiatives in the Arctic regions [Ljovkina, 2021]. To investigate the focus of arctic social online activities, we developed a new classification system and made a typological analysis of online initiatives.

First, we analyzed their distribution by the standard RSI categories: Transport and roads, City infrastructure, Safety, Consumers and service, Population and migration, Economy and Finance, Education and science, State government, State support, Social protection, Natural resources and environment, Houses and courtyards, Business Officials and State services, Suffrage, Health care, Criminal Code, Housing and communal services, and Labour and Employment. ROI categories reflect the object or sphere of the initiatives.

A more in-depth study of the reasons for such distribution of the initiatives by ROI categories required further qualitative and typological analysis.

In particular, we clarified how Arctic initiatives are aligned with sustainable development goals (SDGs) by distributing them by 17 SDGs[2].

In general, the ideas of sustainable development — a general movement towards the goals of economic well-being and social well-being in harmony with nature — are based on the basic humanistic values corresponding to these goals (values of human life, health, and self-realization) [Duran et al., 2015; Missimer et al., 2017]. However, the practical rather than declarative implementation of these ideas requires a deep reengineering of the mechanisms for the development of the existing socio-economic system[3], which has led to today's global problems and continues to generate them [Vveinhardt & Zygmantaite, 2015]. Significant cultural changes and fundamental social transformations are necessary to overcome the SD crisis [Markard et al., 2012; Wallerstein, 2004]. Thus, a primary focus on the strategic changes is needed [Busch, J., 2018, p. 6], while tactic solutions to implement the strategy most effectively and sustainably, and operative solutions are needed to mitigate the current negative social-economic consequences of the existing problems.

Thus, the focus of social activity should also be assessed by the criterion of foresight of civil initiatives, namely, their focus on achieving effects at the strategic, tactical, or operational level of problem-solving. Accordingly, at the next step, we analyzed ROI initiatives by their foresight level (strategic, tactic, and operative).

In the conclusion, we analyzed the initiatives by the type of the problems reflecting their common essential causes: Ineffective communication, information and payment technologies; Ineffective, short-sighted spending of the state budget and support funds; Ineffective and unsafe infrastructure; Unfair socio-economic policies; Inconsistency of current practice and legislation with modern environmental requirements and goals; The opinion and needs of the population when planning sports, cultural and infrastructural facilities, symbols of the city are not taken into account; Ineffective technologies for public participation in decision-making and community management; Unjustified increase in prices, decrease in the quality of goods and services; Activities and recreation practices that are unsafe for the life and health of people; Short-sighted administrative management decisions, lack of focus on long-term sustainable development.

[2] Sustainable Development Goals Report. 2017. URL: https://www.un.org/development/desa/publications/sdg-report-2017.html (accessed: 07.01.2022).

[3] von Weizsäcker E., Wijkman A. 2018. Come On!: Capitalism, Short-termism, Population and the Destruction of the Planet. Springer. URL: https://www.amazon.de/Come-Capitalism-Short-termism-Population-Destruction/dp/1493974181/ref=sr_1_1?ie=UTF8&qid=1508922555&sr=8-1&keywords=come+on+club+of+rome (accessed: 07.01.2022).

Results and Discussion

Table 1. **Distribution of local and regional Arctic initiatives by ROI categories**

ROI category	Frequency	Percentage
Transport and roads	38	30,4 %
City infrastructure	25	20,0 %
Safety	7	5,6 %
Consumers and service	7	5,6 %
Population and migration	0	0,0 %
Economy and finance	3	2,4 %
Education and science	1	0,8 %
State government	7	5,6 %
State support	2	1,6 %
Social protection	7	5,6 %
Natural resources and the environment	17	13,6 %
Houses and courtyards	1	0,8 %
Business	0	0,0 %
Officials and state servicies	0	0,0 %
Suffrage	2	1,6 %
Health care	3	2,4 %
Criminal Code	0	0,0 %
Housing and communal services	5	4,0 %
Labour and Employment	0	0,0 %

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

The residents of the Arctic zone of the Russian Federation showed the greatest interest in the issues of "transport and roads" — 25 initiatives and "city infrastructure" — 15 initiatives. Thus, more than 50% of Arctic initiatives concern city infrastructure, including transport and roads. The concern of Arctic citizens of the environmental problems is in the third place by the number of initiatives (17). ROI categories reflect the object or sphere of the initiatives. A more in-depth study of the reasons for such distribution of the initiatives by ROI categories requires further qualitative and typological analysis.

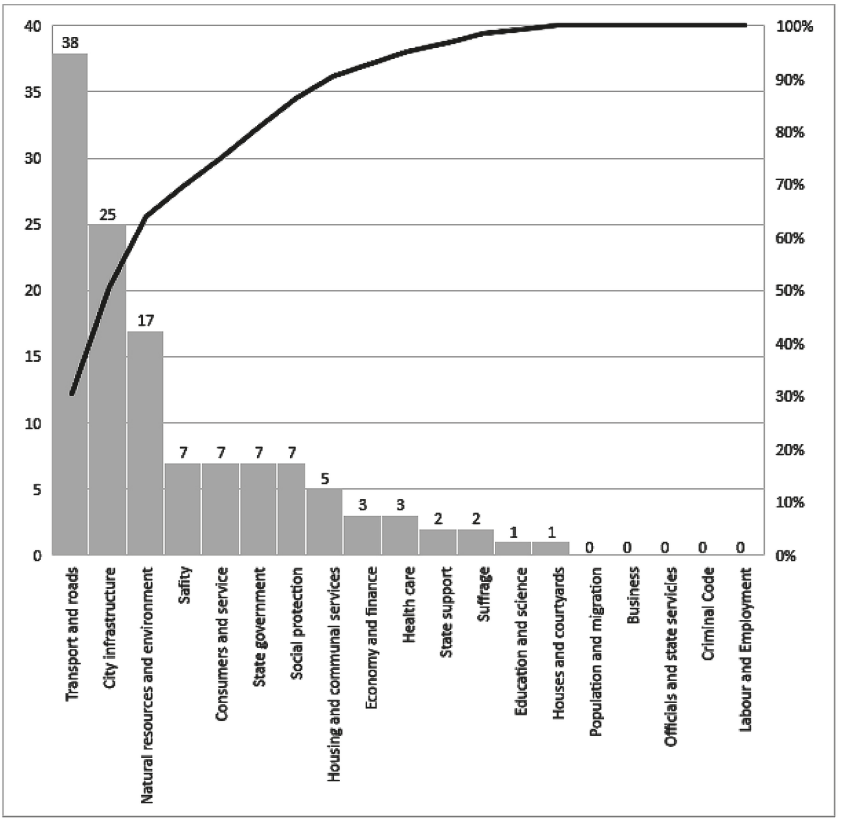

Fig. 1. Distribution of local and regional Arctic initiatives by ROI categories

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

The distribution of ROI initiatives by SDGs revealed that most of the problems of Arctic cities (54,4 %) lay in the sphere of making cities and human settlements inclusive, safe, resilient, and sustainable (SDG11). The significant share of initiatives concerned SDG15 "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" and SDG16 "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels": 9,6 and 10,4 respectively. This situation indirectly confirms the interconnectedness of the problems of developing sustainable cities and participative governance.

Table 2. **Distribution of local and regional Arctic initiatives by SDGs.**

SDG	Frequency	Percentage	SDG	Frequency	Percentage
SDG1	1	0,8 %	SDG10	8	6,4 %
SDG2	2	1,6 %	SDG11	68	54,4 %
SDG3	10	8,0 %	SDG12	7	5,6 %
SDG4	0	0,0 %	SDG13	0	0,0 %
SDG5	0	0,0 %	SDG14	0	0,0 %
SDG6	0	0,0 %	SDG15	12	9,6 %
SDG7	0	0,0 %	SDG16	13	10,4 %
SDG8	4	3,2 %	SDG17	0	0,0 %
SDG9	0	0,0 %			

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

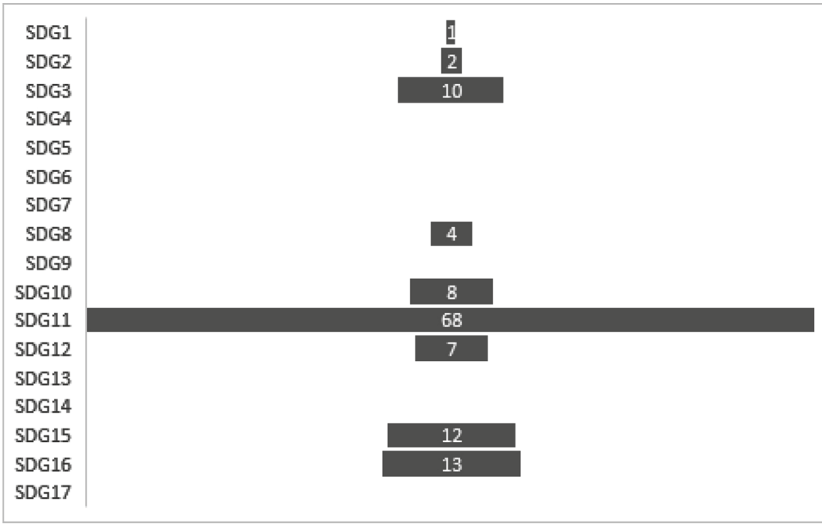

Fig. 2. Distribution of local and regional Arctic initiatives by SDGs

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

*Table 3.D*istribution of local and regional Arctic initiatives by the level of problems

Level of solution	Frequency	Percentage
Strategic	3	2,4 %
Tactic	55	44,0 %
Operative	67	53,6 %

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

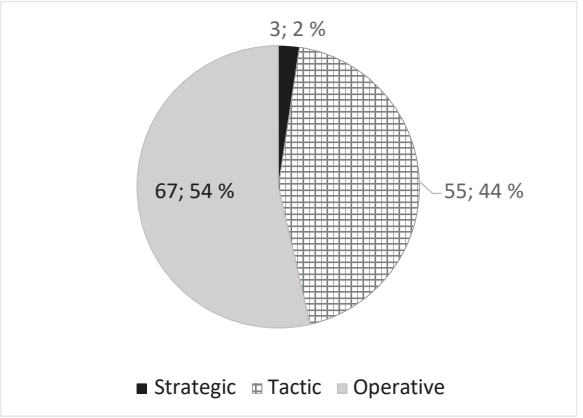

Fig. 3. Distribution of local and regional Arctic initiatives by the level of solution

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

The analysis of the distribution of local and regional Arctic initiatives by the level of solution showed that the main "pool" of online initiatives was focused on the operative problems, which is consequences of the route problems decisions, and on operative solutions aimed at mitigating the negative socio-economic consequences. It is the lack of strategic initiatives for deep constructive socio-economic changes focused on the causes of socially significant problems of Arctic society.

Table 4. **Distribution of local and regional Arctic initiatives by the types of problem**

Type of problem	Code	Frequency	Percentage
Ineffective communication, information, and payment technologies	P1	5	4,0 %
Ineffective, short-sighted spending of the state budget and support funds	P2	2	1,6 %

Type of problem	Code	Frequency	Percentage
Ineffective and unsafe infrastructure planning and condition	P3	40	32,0 %
Unfair socio-economic policies	P4	11	8,8 %
Inconsistency of current practice and legislation with modern environmental requirements and goals	P5	15	12,0 %
The opinion and needs of the population when planning sports, cultural and infrastructural facilities, symbols of the city are not considered	P6	13	10,4 %
Ineffective technologies for public participation in decision-making and community management	P7	11	8,8 %
Unjustified increase in prices, decrease in the quality of goods and services	P8	11	8,8 %
Activities and recreation practices that are unsafe for the life and health of people	P9	7	5,6 %
Short-sighted administrative management decisions, lack of focus on long-term sustainable development	P10	10	8,0 %

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis [Ljovkina, 2021].

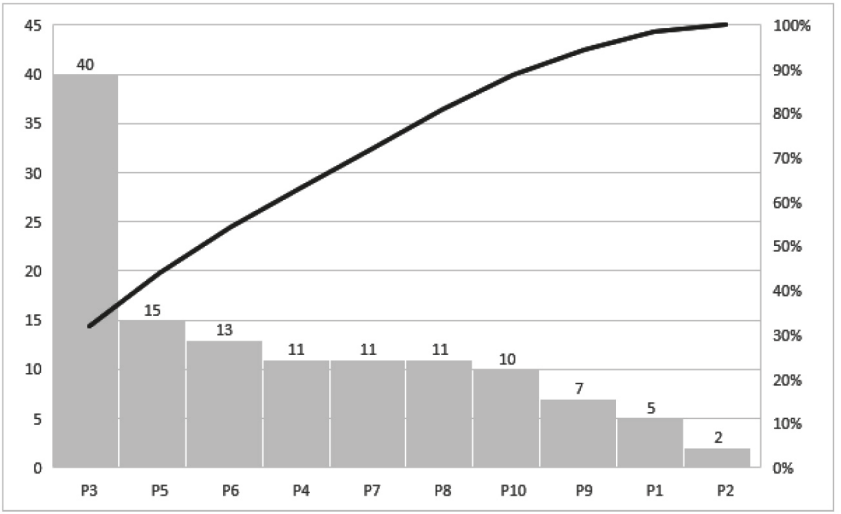

Fig. 4. Distribution of local and regional Arctic initiatives by the types of problem

S o u r c e: data compiled and calculated by author on basis of ROI initiatives analysis[Ljovkina, 2021].

The results of the distribution of local and regional Arctic initiatives by the types of the problem allowed us to clarify the essence of the initiatives in their distributions by ROI categories and by SDGs. Thus, when Arctic citizens concern mostly about "transport and roads" and "city infrastructure" (see Table 3) or "Making cities and human settlements inclusive, safe, resilient and sustainable" (SDG11), they by content reflect the most popular reasons of the formulated problems: "Ineffective and unsafe infrastructure planning and condition" (32 %), "Inconsistency of current practice and legislation with modern environmental requirements and goals" (12 %), and "The opinion and needs of the population when planning sports, cultural and infrastructural facilities, symbols of the city are not considered" (10,4 %).

Conclusion

Successful strategic solution to a great number of different social, economic, and infrastructure problems requires the active involvement of arctic citizens in the processes of decision-making. Nevertheless, the level of social activity concentrates primarily on the operative level — the citizens focus mostly on urgent but short-termed decisions for the problems. Increasing all levels (strategic, tactic, and operative) of social involvement of Arctic residents in the processes of Arctic development requires a set of systemic measures:

- development of internet-based technologies supporting participative governance and involving all categories of arctic citizens in active social activities through online platforms and services;
- discussion and collaborative search of the solution of all common problems reflected online;
- joint discussion and implementation of all constructive initiatives set online;
- wide and transparent "feedback" and public discussion on every stage of solving the problems and implementing the initiatives;
- increasing motivation in social activities and skills in developing new web tools and online technologies for participative governance;
- increasing "proactive" involvement in the processes of social transformations (collaborative developing and implementing initiatives and solutions) instead of prevailing "reactive" government policy and public social behavior (reflecting problems and confronting);
- increasing the general level of civic responsibility through education, culture, and system change of governance processes;

- educating Arctic youth to be citizens, that is to have an active civic position in transformational social-economic processes;
- developing a collaborative culture in governance processes;
- researching the field of social-economic psychology, system analysis, and other scientific fields aimed at finding effective methods and means of increasing social responsibility, social "deinfantilization" and "pessimism", increasing the level of personal interest in the development of the region and the country, and developing an atmosphere of cooperation, a partnership between various social groups for harmonious and effective joint socio-economic development.
- improving online technologies of social involvement in integration with the processes of strategic social transformations;
- developing convenient mobile applications for reflecting problems, discussing and developing initiatives;
- developing a more substantive classification of problems and initiatives to better understanding of the route problems and priority direction of transformation;
- aligning Arctic social activity and governance with the world and Arctic SDGs;
- searching specific effective online technologies to involve the Arctic indigenous population in the active development of the sociocultural space of the region, increasing level of their online social activity, at least voting for initiatives at the municipal and regional levels;
- implementing differentiated accounting of the votes of the indigenous Arctic people, permanent residents of the region, and "labor migrants" for better taking into account the interests of various social groups when considering and implementing initiatives of different types.

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SACRED SITES OF THE ETHNOGRAPHIC CAMP "THE LAND OF HOPE": THEIR PROTECTION AND TOURIST-RECREATIONAL POTENTIAL

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The current article is the first study of environmental feasibility of allocating tourist sites on the sacred grounds of the Land of Hope ethnographic camp. This could enrich existing tourist programmes of the Yamal Peninsula. Hightening conservation status of the sacred sites (to nature monument) will preserve the native ecosystems. Such sacred sites as "Syurdya to" (Nenets *Сюрдя то*), "Khekhe'pe" (Nenets *Хэхэ'пэ*), "a place near lake Kharampeto" meet requirements for nature monuments. These sites may also become popular ethnic and ecological and geological tourism destinations. The sacred space "Sikhirtya" may well be considered as a potential nature monument after testing the lake water and surrounding soils for radioactive isotopes and high-density metals. In order to develop the Land of Hope into a tourist attraction it is necessary to upgrade its facilities and ensure all season transport accessibility of the camp.

Keywords: sacred sites, the Land of Hope ethnographic camp, tourist and recreational potential, nature park, indigenous minorities of the North, Yamal-Nenets Autonomous Okrug, Russian Arctic.

Introduction

Many of the sacred places of the nomadic tundra dwellers may be considered model natural complexes and be of considerable research interest. On these plots of land, economic activity is prohibited (or considerably restricted), consequently native biodiversity is preserved there. On the territory of Yamalo-Nenets Autonomous Okrug (hereinafter YANAO), sacred sites have long received attention [Kharyuchi, 2000, 2013, 2017; Lar, 2003]. In 2001–2002, the Conservation Value of Sacred Sites of Indigenous Peoples of the Arctic: A Case Study in Northern Russia performed a large-scale investigation of the Russian indigenous peoples of the North and listed 250 sacred Nenets sites of the Gydan Peninsula[1]. The sacred site status is not limited to just world heritage site status. Unfortunately, it is not enough for proper conservation as Angalsky Mys and Numto Lake sites show [Morgun, 2020]. As of now, the sacred sites are in different conditions. Researchers

[1] The Conservation Value of Sacred Sites of Indigenous Peoples of the Arctic: A Case Study in Northern Russia. Report. 2004. Moscow: RAIPON.

register a change in the shrines' status: places of worship lose their significance for a family, are moved, etc. [Kharyuchi, 2013, 2000], along with that biodiversity may decrease or even be lost.

These processes add significance to scientific recognition of key sacred sites where landscape and biological diversity is undisturbed. It is also important that these areas are granted a 'natural monument' status and included in the regional nature conservation network. At the same time non-indigenous people show growing interest to the sacred places, therefore it is necessary to allocate several sacred sites for tourist purposes in order to control unorganised visits to such places, prevent vandalism and conflicts with the indigenous people.

Research Area

The Land of Hope camp is located in the Priuralsky District of the Yamal-Nenets Autonomous Okrug, 25 km (15.5 mi) to the north-west of Laborovaya village, in the Gornokhadatinsky area, Polar Ural Nature Reserve. It holds a status of a factory (trading post). Its area is 7.3 ha (17.3 ac).

The territory belongs to the western part of the Atlantic-Arctic region the winter is long and snowy, with frequent winds mostly from the south and south-west (frequent snowstorms, more than 110 days a year). The snow cover depth is 90 cm (3ft) and more. The snow cover period is about 240 days. The January mean temperature is –26 °C (–14.8 °F). The summer is short and cold. The July mean temperature is +13 °C (+55.4 °F). Average precipitation in the warm period is 350–400 mm [Atlas of the Yamalo-Nenets Autonomous Okrug: Maps, 2004].

It is mostly piedmont flatland and hillside, with occasional low upland patches, moraine hills and ridges under 350 m (383 yd) above sea level (the Kharagam-Pe (Rus. *Харагам-Пэ*) ridge, 330 m (360 yd) [Shakirov, 2011]. This plainland abounds in creogenic relief: permafrost mounds and thermokarst shallow lakes and bogs. The surface of lakes of the territory accounts for 15 % of its total area [Vegetation Cover and Vegetation Resources of the Polar Urals, 2006].

Facilities. The camp includes the following buildings: four guest houses (yurts), an eating house, a semipermanent school, a nomad kindergarten, an electric module for distance nomad learning; four dwelling houses; a bathhouse; a scientific station; a diesel power station; seven chapels; priories of Orthodox monks; the Archangel Michael church.

Methods

Horizon samples were taken from soil sections of unpolluted sites[2]. The soils were described by the soil sections[3]. Types of soils were determined according to a classification of 2004 [Shishov et al., 2004]. Geobotanical descriptions were given for communities from different associations and from diverse reliefs, at the same time we chose most common plots or several plots if their vegetation varied. A sample plot is a square of 50 m^2 (60 ya^2)[4]. Abundance of grass and dwarf-shrub layer was assessed in % against the Drude scale, the Braun-Blanquet classification was used to classify plant communities [Braun-Blanquet, 1965]. The sacred places were described according to common sociological methods [Methods of Collecting Information in Sociological Research, 1990]. The analysis of the camp's wildlife management for tourist and recreational purposes included a description of the objects shown to tourists and a discovery of probable tourist options (contributing and limiting internal and external factors). In order to assess a territory's level of attraction for tourists, we used a scoring system (0–3 — low; 4–7 — medium; 8–10 — high).

Results and Discussion

Anna Nerkagi, a famous Nenets writer, started and heads an original ethnographic "school of life in the tundra" for orphans and reindeer herders' children from neighboring nomad camps. There are four ethno educational models: nomad, seminomadic, stationary, distance nomad schools. This is why the Land of Hope ethnic camp attracts both foreign (from Australia, China, France, Germany and the USA) and Russian tourists. The regional tourist market advertises several tourist routes. For example, a local tourist agency called Yasavey (Nenets *Ясавэй*) offers a seven day tour called Ethnic Yasavey, that costs 98 thousand rubles per person. The tour includes: accommodation at an ethnographic camp in a yurt or in a tent, meals, reindeer sledding, guiding, transfer, etc. At an ethnographic camp, tourists are offered master classes on making national clothes, tasting Nenets dishes, visiting the church of the Archangel Michael; fishing on Lake Kharampe-To or two-day trips to Lake Bolshoye Shchuchye; and trying the life of reindeer herders.

[2] GOST 17.4.3.01-2017 Nature Protection. Soils. General Requirements for Sampling. *Okhrana prirody. Pochvy. Obshhie trebovaniya k otboru prob*: official text: as of 2017.

[3] Practical Work on Soil Science. *Praktikum po pochvovedeniyu*. 1980. Kaurichev I. (*Ed*). M.: Kolos.

[4] Ipatov V., Mirin D. 2008. Description of Phytocenosis: Methodical Recommendations. Study Guide. SPb.

Generally, these events are positioned by local travel agencies as ecological and ethnographic tourism which is considered here as the introduction to the traditional culture of the indigenous North peoples and to the wild nature of the North.

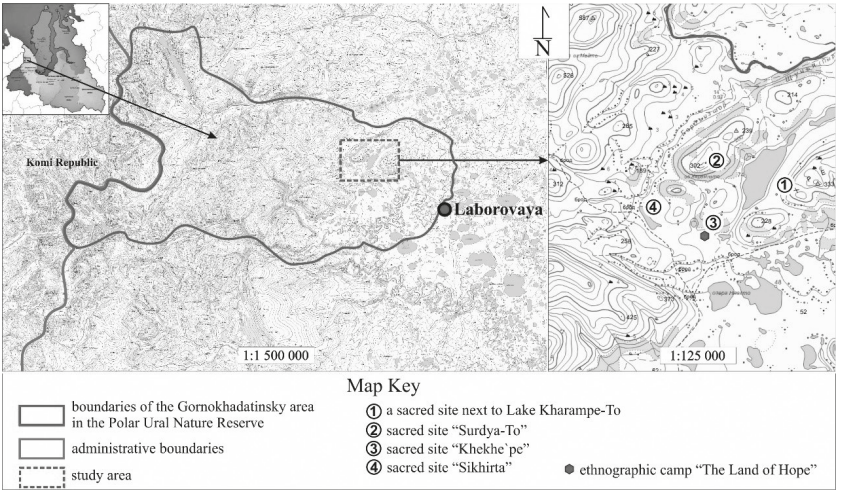

Fig. 1. Position of sacred sites within the territory of the ethnographic camp "The Land of Hope"

Source: Authors.

There are several sacred sites within the territory of the ethnographic camp "The Land of Hope" accessible for tourists by the permission of the local people. The expedition trips were organised in 2017–2021 to make descriptions and environmental assessment of the potential protection and of using it as an object of ethnoecological display for tourists.

The Sacred Site "Surdya-To" (located above the camp)

The Place of Worship of the Mountain Landlord.

1. Accessibility. The site is located at a distance of 1 km on the mountain, above the camp.

2. *The beauty of the area and the diversity of the landscape (geomorphology).* The area of the site is a sample of alpine relief with large-block moraine heaps. At the same time, it retains a sense of ecological safety and sustainability.

3. *Geological attractiveness.* The site is characterized by a variety of attractive geological factors, the main of which is tectonic, determined by the location of the site in a prominent zone of the serpentinite melange of the

Main Ural Thrust.The exposure, representativeness and accessibility for inspection and study have no analogues in the circumpolar world.

4. Soils are characterized as mountain-tundra, primitive, stony, fragmentarily peaty and light clayey in texture. The thickness of the soil body is up to 7 cm. The stony content is up to 60 %.

5. Vegetation can be described as shrub-moss-lichen stony. The shrub layer is represented by Empetrum nigrum, Rhodococcum vitis-idea, Vaccinium uliginosum, Ledum palustre, and Salix rotundifolia (along the edges of the phytocenosis). The shoots here have a creeping shape. Such small graminaceous plants as Arctous alpina, Dryas punctata are noted between the stone fields. Festuca rubra was marked as well. The total plant cover is up to 15 %. Moss and lichen cover was found in spots alongside the microrelief elements.

On the slopes, there are small groups of the species Rhodiola quadrifida (Pall.), listed in the Red Book of the Yamalo-Nenets Autonomous Okrug.

6. Recreational opportunities. The study area has a powerful geological and biological energy, which can be explained by its location in the deep split zone and the saturation of mineral energetics (jasper, jadeite, nephrite, demantoid, etc.).

Thus, the sacred site named "Sacred Mountain" totally meets the requirements for natural monuments with its features. This site can become a popular object of ethno-ecological and geological tourism, as well as a scientific testing ground.

The Sacred Site "Sikhirta"

The sikhirta habitat (from Nenets "disappearing people", "people who disappear at the sight of other people") includes a complex of an oval-shaped lake (the so-called "dead lake") and a small hill (the so-called "bald" hill). According to legends, the hill is the dwelling of sikhirta, and the dead lake is the dwelling of spirits, and as a result there is a constant struggle for the territory between sikhirta and the lake spirits. For this reason, there is no fish in the lake, and even the artificial releases of fry immediately die (the plot of the legend was recorded by us according to A. P. Nerkaga in August 2019).

1. Accessibility. The site is located at a distance of 14 km from the camp in the direction of the reindeer breeders' camp; there is also a knurled road nearby.

2. The beauty of the area and the diversity of the landscape. The territory of the sacred site is a mountain tundra meadow.

3. Soils are characterized as mountain-tundra, stony, gley, peaty humus and light loamy in their texture. The thickness of the soil body is up to 25 cm. The stony content is up to 40 %.

4. Vegetation is represented by rare bushes Betula nana and the creeping form of Salix sp. There are low-growing bushes of lingonberry, as well as the species of Calamagrostis neglecta, Poa alpina, Festuca pratesis, Veronica alpina, Dianthus versicolour. The total projective cover is up to 15–25 %. Moss and lichen cover is sparse and located in the form of spots.

5. Recreational opportunities. According to the Orthodox monks who were the members of the expedition group, the study area has a very powerful energy.

Thus, the sacred site "Sikhirta" can be considered as a potential natural monument. This site has already become a popular attraction of ethno-ecological tourism. However, additional research on the content of radioactive isotopes and heavy metals in the lake water and soils is to be carried out.

The sacred site "Khekhe'pe" (in the camp) (according to other sources it is called "Khebidya pe") which means a secret (hidden) lake. The legend tells that every night the spirit living in the lake (or, perhaps, near the lake) bypasses the settlement and protects the peace of the sleeping inhabitants (according to the nomadic educators Taybery T. and Laptsuy M.).

1. Accessibility. The site is located in the camp, between a nomadic school and the priory of Orthodox monks.

2. The beauty of the area and the diversity of the landscape. The area of the site retains unique aesthetic properties, which are represented at several hierarchically harmonious spatial levels.

3. Soils are low-podzoliced and humic-illuvial ones.

4. Vegetation of it can be described as a larch, dwarf birch and shrub-moss woodland. The stand of trees is rare; the dominant species is Larix sibirica (with the height of up to 10–15 m) mixed with Picea obovata. There are some microgroups of Betula nana, Juniperus sibirica, Vaccinium uliginosum, Empetrum nigrum noted as well. The grass stand consists of Carex globularis, Festuca ovina, Polygonum bistorta subsp. ellipticum, Campanula spp., Rhodiola rosea. The ground cover is formed by green mosses and lichens. The projective cover is up to 80 % (where Polytrichum commune prevails). The species Rhodiola rosea, also noted in the site, is listed in the Red Book of the Yamalo-Nenets Autonomous Okrug.

5. Recreational opportunities. The study area has powerful geological and biological energy, it can be concluded from the location of the Orthodox monks priory on the shore of the lake.

Consequently, the sacred site "Khekhe'pe" totally meets the requirements for natural monuments in its features.

The sacred site near Lake Kharampe-to (from Nenets — "a lake of a river that bends around a mountain" or "a lake that bends around a moun-

tain"). "Khara" (Nenets) stands for a meander of a river, which is considered as "a place of power". According to the stories of the settlement inhabitants, it was this site where they sacrificed deer in the 1950-s.

1. Accessibility. Lake Kharampe-to is located 3 km from the camp. The exact location of the sacred site needs clarifying.

2. The beauty of the area and the diversity of the landscape. The area around the lake can be viewed as a standard of "wild nature" in the form of a lake, overgrown with deciduous forest. The ecology of the study area is obviously undisturbed.

3. Soils are characterised as gley and low-podzolised.

4. Vegetation is represented by a spruce, larch and shrub forest. The dominant species is Larix sibirica, featuring Picea obovata and Betula tortuosa as well. The projective cover of Betula nana in the undergrowth is up to 25 %. The shrub layer is formed by Rhodococcum vitis-idea, Ledum palustre and Vaccinium myrtillus. Carex spp. and Eguisetum sylvaticum are also represented. Moss and lichen cover is sparse.

The species of Castilleja arctica Kryl and Pyrola grandiflora Radius listed in the Red Book of the Yamalo-Nenets Autonomous Okrug were recorded here.

5. Recreational opportunities. Musk oxen (Ovibos moschatus), released from the second cordon enclosures of the Gornokhadatinsky area in the Polar Ural Regional Nature Reserve, graze in the study area.

It can be concluded that the sacred site near Lake Kharampe-to meets the requirements for natural monuments. It is necessary to clarify the location of the "sacrificial" site.

To assess the development of the ethnographic camp as a perspective tourist destination, some constraining factors were also identified and pictured in Fig. 2.

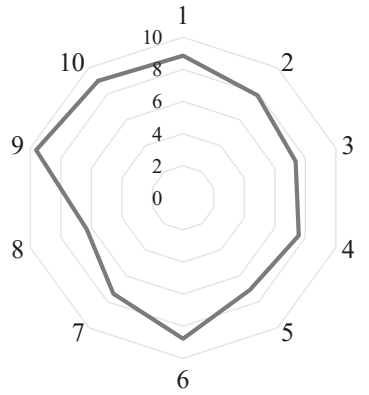

Fig. 2. Ranking of constraining factors according to their influence on the development of the ethnographic camp "The Land of Hope" tourist and recreational activities

Source: Authors.

F-1. Tourism infrastructure can be assessed as underdeveloped. The tourist programme currently implemented lacks diversity.

F-2. Difficulty of accessibility and logistics. The ethnographic camp is out of the way of the main transport hubs and far from the settlements of the Priuralsky District, of the towns of Salekhard and Labytnangi. Along the touristic routes some areas are quite dangerous because of their relief features (such as numerous rivers, streams, swamps and passes); they require increased driver`s attention, and, according to safety measures, the simultaneous traffic along the routes is allowed only for two vehicles of increased patency.

F-3. Environmental and recreational load. Unregulated tourism and increased recreational load can lead to the degradation of natural territorial complexes of the Polar Urals.

F-4. The cost of a tourist product. The cost of a tourist product depends on the methods of tourists` delivery to the excursion object.

F-5. Safety of tourists. There is no rural health post in the nearby settlement (the village of Laborovaya).

F-6. Lack of qualified personnel. Most of the guides have fragmentary knowledge of the natural objects, their specifics, properties and characteristics. Therefore, the existing tourist routes are not actually informative enough.

F-7. Promotion of tourism. The Department of Youth Policy and Tourism, The Agency for the Development of Regional Tourism (which is a state institution of the Yamalo-Nenets Autonomous Okrug), the information and communication platform Visityamal use advertising and press tours to promote tourist attractions in the Polar Urals. However, the main problem is an unreliable and/or fragmentary description of natural objects and phenomena.

F-8. Seasonality featured by climatic conditions, a large number of midges in summer, lack of balneological resources and severe frosts and snowstorms in winter also plays its role as a constraining factor.

F-9. Outdated facilities of the camp. There is a need to renovate its diesel power plant and to modernize tourist accommodation (yurts).

F-10. The legal form of ownership and status is defined as a factory located on the territory of the Polar-Ural Natural Reserve.

It is important to note that Factors 2 and 9 limit the time tourists spend on the territory of the ethnographic camp, and therefore individual visits are not economically profitable [Morgun, 2020].

In conclusion it should be stated that tourism for research purposes (to visit large and small Shchuchye lakes, the Syu-Keu massif, the Yangan-Pe massif, Moscow State University glaciers, to study muskoxen (Ovibos mos-

chatus), etc. [Loktev,2018], as well as religious tourism and pilgrimage (to the church of Archangel Michael, the Holy Trinity church, nomadic missionary school and the monks priories) seem to be preferable; they can be complemented by the introduction to the Nenets sacred sites. The development of these types of tourism will expand the range of tourist services and its target audience, thereby increasing the regulated tourist flow.

Conclusion

The evaluated sacred sites of "Surdya-To", "Khekhe`pe" and a sacred site next to Lake Kharampe-To totally meet the requirements for natural monuments in their features. These sites can also become popular objects of ethno-ecological and geological tourism.

The sacred site of "Sikhirta" may well be considered as a potential natural monument. This site has already become a popular object of ethno-ecological tourism. However, it is necessary to conduct additional research on the content of radioactive isotopes and heavy metals in the lake water and soils.

To develop the ethnic settlement "The Land of Hope" as an attractive tourist destination, it is necessary to solve the problems of updating its facilities, as well as to ensure all season transport accessibility of the camp.

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SCIENTIFIC AND TECHNICAL OPPORTUNITIES FOR YEAR-ROUND HIGH QUALITY PLANT PRODUCTION IN THE ARCTIC

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The article is devoted to the scientifically grounded solution to the problem of intensive resource-saving year-round waste-free growing of plants in the extreme conditions of the Arctic and the stable obtaining of crop production with high yields, in terms of quality and safety corresponding to the sanitary and hygienic standards of the Russian Federation. This problem is solved by the realization of the Agrophysical Research Institute (ARI) project on the creation and implementation of scalable autonomous phytotechcomplexes, providing year-round high quality plant production in the immediate vicinity of the consumer. The description of the project core is given. The main advantages of phytotechcomplexes relative to native and foreign analogues, indicating the prospects of their widespread introduction in our country, are shown.

Keywords: scalable phytotechcomplexes, arctic greenhouses, automated resource-saving technologies, vegetation and lighting equipment of various types, year-round production, controlled conditions of environment, adapted to the growing conditions highly productive varieties and hybrids, plant products, high quality and yield.

The development and implementation of new innovative energy-efficient and resource-saving technologies for the high-quality plant production[1], based on knowledge of the mechanisms for realizing the growing potential of plants, is highly relevant due to the insufficient provision of our country population with fresh high-quality greenhouse vegetables (about 52.4 %), especially in the regions of the Arctic zone with severe natural and climatic conditions (20–40 %)[2]. A science-intensive project for the creation

[1] Strategy of scientific and technological development of the Russian Federation: official text: as of 01.12.2016; Doctrine of the Russian Federation food security: official text 21.01.2020; Federal scientific and technical development program for the agriculture in 2017–2025: official text: 25.08.2017.

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of high tech scalable automated phytotechcomplexes with an optimized habitat for intensive energy-efficient and resource-saving plant production with specified quality and functional characteristics has been developed at Agrophysical Research Institute (ARI) on the basis of knowledge obtained in the course of many years of research into the functioning of the soil-microorganisms-plant system on an agrobiological polygon with controlled conditions and directional variation of the light, air and root environment parametres.

Phytotechcomplexes (Fig. 1) are agrobio-technogenic systems, consisting of a engineering and technical structures set with controlled microclimate conditions, and of vegetation and lighting equipment with resource-saving technologies for the high-quality plant production, as well as a set of varieties most adapted to the growing conditions and crop hybrids with high productivity potential and development rate[3] [Panova et al., 2015].

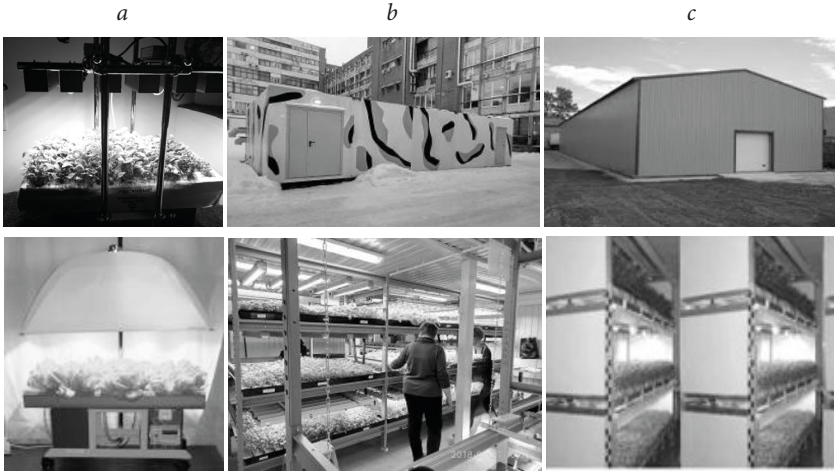

Fig. 1. Phytotechcomplexes developed at ARI, with controlled microclimate conditions and vegetation and lighting equipment based on resource-saving technologies for the high-quality plant production: (a) small-sized built-in, (b) mobile, (c) stationary

Source: ARI.

The project for the phytotechcomplexes creation contains more than a dozen new technical and technological solutions obtained on the basis

25. http://mcx.ru/press-service/news/dmitriy-patrushev-vystupil-pered-deputatami-gosdumy-po-teme-realizatsii-gosprogrammy-razvitiya-selsk (accessed: 12.12.2021).

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of the knowledge and many years of experience of the ARI in the field of artificial lightphysiology and plants artificial lightculture. The light environment of plants is formed through the use of energy-efficient LED units with automatically adjustable light intensity and optimized spectral composition [Panova et al., 2020]. In the course of numerous studies, we have established the advantage for plants of a radiation spectrum close to sunlight, which indicates the decisive role of the entire wavelength range in the visible region of the spectrum for optimizing the course of photosynthetic reactions; accumulation and transformation of light energy; regulation of metabolism; synthesis of metabolites, protective compounds, etc.; other physical and chemical processes in a living leaf; as well as the significant regulatory role of the red/far red ratio perceived by phytochromes [Kuleshova et al., 2019, Kuleshova et al., 2021]. The selection of a LEDs combination in order to realize a spectrum close to solar radiation is a rather difficult task to solve. The photosynthetically active and physiologically significant radiation spectrum for plants was realized using LED technologies — the use of a phosphor polymer made it possible to achieve light radiation as close as possible to sunlight in the visible range of the spectrum [Panova et al., 2020]. The use of such light source under conditions of intensive artificial lightculture leads to an increase in productivity in comparison even with standard sodium lamps (Table 1), which, under conditions of the same irradiation, previously have not been received for any LED lamp.

The root environment is formed on the principle of intensive plant cultivation by the panoponics method using thin-layer or low-volume soil analogs with a circulating nutrient solution of an optimized composition for the cultivated crop [Ermakov, 2009]. The use of low-volume and thin-layer panoponics makes it possible to a certain extent to close the weak points of other common methods of growing plants (hydroponic, aerohydroponic, aeroponic, etc.). Low cost, high productivity, nature-friendly composition of solutions, optimized ratio of solid, liquid and gaseous components of the medium for plant root systems, high quality of the resulting plant products, including organoleptic characteristics, technological ease of operation with equal efficiency of water and fertilizer use compared to closed hydroponic systems all together form the basis and emphasize the prospects for the widespread introduction of this technology into production.

An important aspect of high-quality plant products planned yields obtaining is the condition of its original seed material. The development of principles for the selection of biologically valuable seeds, especially for growing economically valuable vegetable products, requires taking into account not only external, but also hidden defects and anomalies of seeds, which becomes possible with the use of non-invasive technologies for rapid

Table 1. **Tomato productivity when grown on a thin-layer analogue of soil under different light sources (irradiance 90 W/m^2 in the PAR region)**

Light source	The number of fruits, pcs./plant	Fruit weight, g/plant	Weight of 1 fruit, g	Fruit yield, kg/m^2
High-pressure sodium lamps HPS (reference) 	48±6	341±67	7,1±0,5	8,5±1,8
LED lamp with improved spectral composition 	44±5	415±82	9,5±0,9	10,3±1,3

S o u r c e: original data from the ARI experimental area (agrobiopolygon).

seed assessment. Since the 1980s, the ARI has been working on the development of specialized equipment and methods for X-ray photography with direct X-ray magnification of seeds, a corresponding technology for seed quality control has been created (Fig. 2). The non-destructive method of express control developed in recent years (soft-beam microfocus radiography with automated analysis of radiographs) of various agricultural crops seeds makes it possible in a matter of minutes to quantify all defects hidden in seeds (internal germination, embryo trauma, enzyme-mycotic depletion-infestation by insect pests, the development of the phytopathogenic fungi mycelium, empty grain (incompleteness) of the seed), and the revealed relationships and dependences of a hidden defect development degree with indicators of seed germination, growth force of seedlings at the early stages

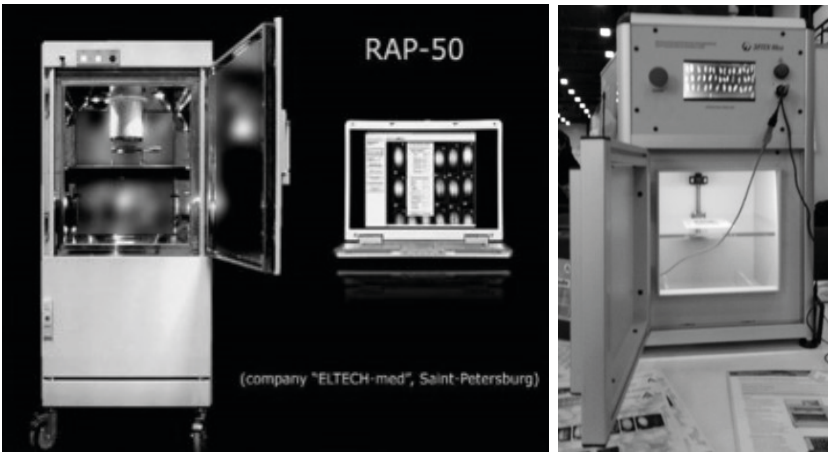

Fig. 2.An improved hardware and software complex based on a mobile X-ray diagnostic unit PRDU-02 for seeds and grain quality control (developed by ARI and ETU)

S o u r c e: original photographs by ARI (Plant Biophysics Sector) and ETU.

of plant development [Priyatkin et al., 2018, Arkhipov et al., 2019,] made it possible to objectively make recommendations on the appropriateness of their further use and to select high-quality lots of seeds, which is especially important for the conditions of closed systems of plant cultivation, in particular, phytotechcomplexes.

The development and implementation of new resource-saving technologies for intensive plant production in phytotechcomplexes with a high level of environmental conditions regulation requires the search and selection of the most adapted varieties and hybrids of plants, as well as the creation of new early ripening highly productive forms with improved economically valuable properties for growing conditions. We have created a constantly updated data bank on the varieties and hybrids of vegetable crops most adapted to the conditions of intensive artificial lightculture. The selection of early ripening varieties and hybrids with a high degree of the production potential realization under the conditions of artificial lightculture is carried out (Fig. 3). An original breeding methodology for obtaining new forms of agricultural crops with a predictable complex of economically valuable traits has been developed relying on the theory of ecological and genetic organisation of quantitative traits (TEGOQT) and methods for studying the genotype-environment interaction in a regulated agroecosystem [Kochetov et al., 2012, Dragavtsev, 2018]. Petersburg violet and Petersburg pink — the first varieties with a lettuce leaf type for artificial lightculture in Russia, radish lines with a short period vegetation, exceeding the productivity of the

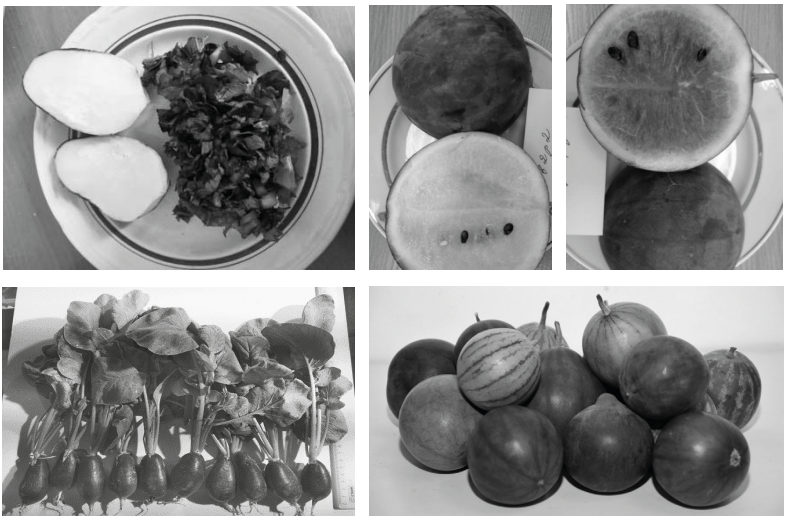

Fig. 3. Adapted for intensive artificial lightculture the Petersburg violet radish variety with lettuce leaf type and watermelon fruits with yields of 75–90 kg/m^2 and 30–36 kg/m^2 per year, respectively

Source: original photographs by ARI (Laboratory of Environmental Genetics and Breeding).

best available varieties by 40–70 %, were created based on the assessment of plant collections in artificial lightculture, the search and identification of parent varieties-sources of selectively valuable traits, unique varieties of radish resistant to stemming. Hybrids of radish and daikon were obtained that can form marketable root crops weighing 100 g or more in 45 days of vegetation period when grown on a low-volume soil analogs [Sinyavina et al., 2019, Kochetov et al., 2021].

The consistency of the approach applied at the ARI to solving the problem of ensuring stable high yields of quality plant products made it possible to provide significant advantages of the developed phytotechcomplexes relative to cultivation facilities (factories) — analogues in our country and abroad. Thus, analysis of literature data indicates that the yield, in particular of salad crops in foreign plant factories, ranges from 26 to 66 kg/m^2 per year with predominant values of about 30–45 kg/m^2 [Kozai, 2016, Armanda et al. 2019], which is almost 2 times lower than that obtained by thin-layer panoponics technology at the ARI (Table 2). A similar formation of significantly more productive plants when they are grown using ARI technologies is observed in fruit, root crops and other vegetable crops. The engaging, for example, of a useful volume of a room with a height of 4 m in the implementation of the technologies developed at ARI will potentially

Table 2. **Productivity of the main vegetable crops in modern industrial greenhouses with artificial supplementary lighting and in plant growing light installations of phytotechcomplexes**

Plant culture	Industrial greenhouse complexes Crop productivity*, kg/m² per year	ARI Phytotechcomplexes	
		Crop productivity, kg/m² per year	Crop productivity, kg/m²of tiers — height 4 metreper year
Tomato	70–85 (stalk — 4 metres)	90–110 (1 tier installation, stalk — 0.50 m) 40–50 (1 tier of installation, stalk — 0.25 m)	320–400 320–480
Cucumber	90–135 (stalk — 4 metres)	90–150 (stalk — 2 metres)	210–230
Lettuce	46–50	60–70 (1 tier installation)	480–560

Source: * — averaged data from [Shao et al., 2016; Moline and Martin 2018; Kozai et al., 2019; Ifarm website: https://ifarmproject.ru/].

make it possible to form yields of cucumber 1.5–2 times higher, tomato — 3.5–4.0 times higher than in advanced greenhouse complexes with a similar useful volume, using supplementary lighting with artificial light.

The plant growing system proposed by ARI due to its high yield has equal or lower cost values compared to those of foreign companies, despite slightly higher operating costs for light electricity. And the high productivity and quality of plant products [Panova et al., 2020; Kuleshova et al., 2021] will provide a shorter payback period for organising production in phytotechcomplexes or plant factories using the ARI technology in comparison with foreign or domestic conventional functional analogues. Taken together, the above indicates the prospects for the implementation of the project "Scalable phytotechcomplexes for year-round high quality plant production in the Arctic" from the technological, economic and social points of view and the possibility with their help within 3–5 years to significantly improve the situation with the provision of the Russian Federation Arctic zone population with high quality fresh plant products.

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RUSSIA AND CHINA IN THE ARCTIC: COOPERATION IN RARE EARTHS MINING

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The paper briefly reviews the current state of world market of rare earth elements that are the strategic raw materials for advance technologies. Special attention is given to China as key player in this market and proactive investor in rare earths mining in Arctic region. We also present the outline of rare earths deposits in Russian Arctic. We conclude by highlighting possible Chinese-Russian cooperation in rare earths mining taking into account the feasibility for collaboration with China under anti-Russian economic sanctions along with minimization of geo-economic risks and standing for rational protectionist policiesfor Russia in the Arctic.

Keywords: Arcticregion, rareearthelements, Russia, China, cooperation, advanced technologies

Introduction

The Arctic is a territory of around 4 million inhabitants, comprised of the northern pole, most territories continental shelves and exclusive economic zones of the eight countries-Russia, Canada, the United States (Alaska), Norway, Denmark (including Greenland and the Faroe Islands), Iceland, Sweden, and Finland. The Arctic region contains oil and gas reserves, mineral deposits and fish stocks. The economics of the circumpolar Arctic areas is mainly based on large-scale exploitation of natural resources.

Currently the international cooperation in the Arctic develops rapidly due to technological change — from one side, and proactive Chinese policy in the region — from another side.

On 15May 2021, the Concept of Russia's chairmanship of the Arctic Council in 2021–2023 and a plan of measures were approved. This Concept provides the Arctic Council to be the key association, which coordinates international activities in the region, and the cooperation with Arctic states on both a bilateral and multilateral regional basis[1].

Given that Russia's economy is heavily based on the exploitation of natural resources, the Arctic is considered to be the one of the strategic zones. The development of the Arctic region is conditioned not only by environmental purposes, but also by geo-economic and geopolitical issues it represents for bordering countries [Sokolovska &Thiel, 2018].

[1] Mikhail Mishustin approved the Concept of Russia's Chairmanship of the Arctic Council in 2021–2023 and an Action plan. May 15, 2021. http://government.ru/news/42186/ (accessed: 10.12.2021). (In Russian)

The paper aims tohighlight possible Chinese-Russian cooperation in rare earths miningtaking into account the feasibility for collaboration with China under anti-Russian economic sanctions along with minimization of geo-economic risks for Russia in the Arctic. To deal with, we briefly review the current state of world market of rare earth elements. Special attention is given to China as key player in this market and proactive investor in rare earths mining in Arctic region.

The article is structured as follows. Section I provides brief review of supply and demand for rare earth elements in countries worldwide. Special attention is given to China as key player in the global market of rare earths. Section II investigates the increasing presence of China in the Arctic region and presents the outline of rare earths deposits in the Russian Arctic.

Rare Earths Industry in the World

Rare earth elements consist of 17 different minerals being one of the cornerstones of green energy — they are used for manufacturing electric vehicles and wind turbines, consumer electronics, and magnets. The latest are widely used in batteries and smartphones (for example, the Apple iPhone contains 9 rare earth elements from 17).

Theincrease in production of high-tech goods leads to the increase in demand for rare earth elements (Fig. 1).

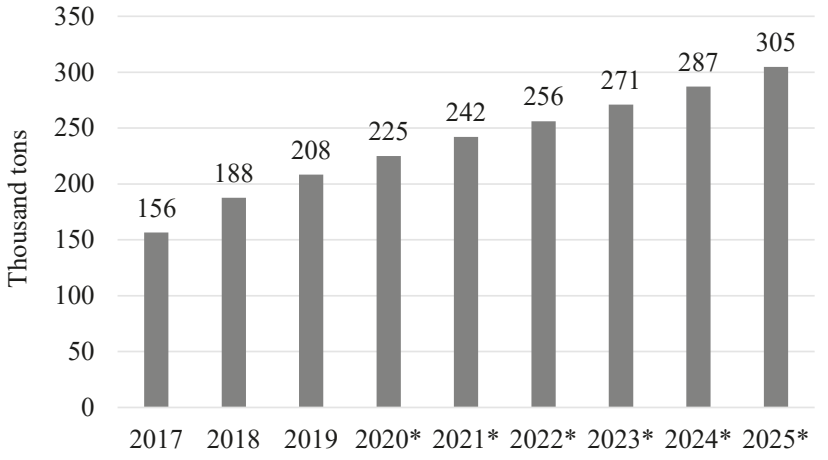

Fig. 1. Rare earth oxide demand worldwide, 2017–2025

Source: authorsfrom [Statista, 2021].
Note: * — forecast values.

The total global demand for rare earth elements (oxides) is expected to face a gradual increase from 225 tons in 2020 to a forecasted 305 tons by 2025. In 2021, the sharp increase in demand on rare earth oxides caused by two main reasons, notably, the increase in the use of electric vehicles and COVID-19 pandemic. The latest causedthe significant recovery in the demand on electronic devices needed to enable the remote work.

China is currently meeting thegreatest part of demand on rare earths. The country produces about 58 % of global rare earth elements (Fig. 2) and 30 % of world deposits of rare earths are there. China is also a leading processor and exporter of rare earth metals, despite export restrictions measures introduced in January 2021.

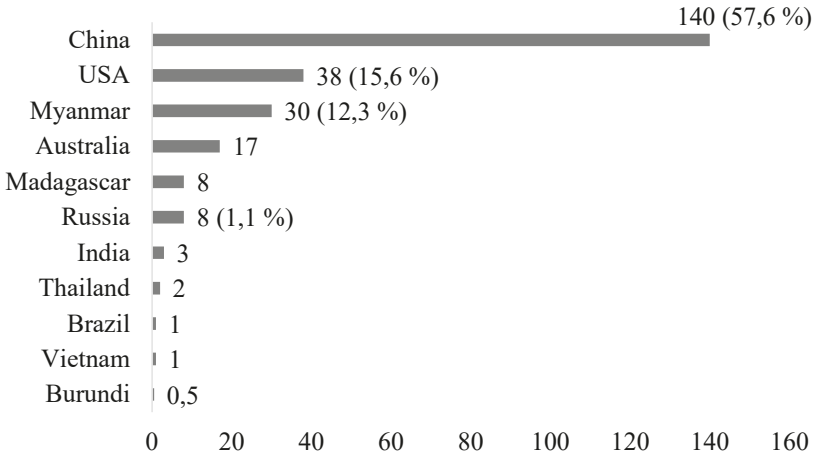

Fig. 2. Major countries in rare earth mine production, 2020thousand metric tons (share of global production)

Source: authorsfrom Rare earths industry worldwide[2].

Note: the figures in brackets denote the countries' share in global production of rare earths.

China's leading position in rare earths manufacturing has expanded significantly in the early 1980s, when the U.S. Nuclear Regulatory Commission (NRC) imposed restrictions on mining and production of rare earth metals. This led to the shortage of raw materials in certain strategic U.S. industries. In these conditions, China has actively developed the mining and processing of rare earth elements, extracted from own deposits, along with recording the intellectual property rights for appropriate processing tech-

[2] Rare earths industry worldwide. Statista, 2021.

nologies[3]. Currently, China is the only country in the world with a complete chain of rare earths production — from mining and ore processing todeliveries of finished products.

Such national policy led to an increase in production of rare earths resulted in the country being a global leader in this area (Fig. 3).

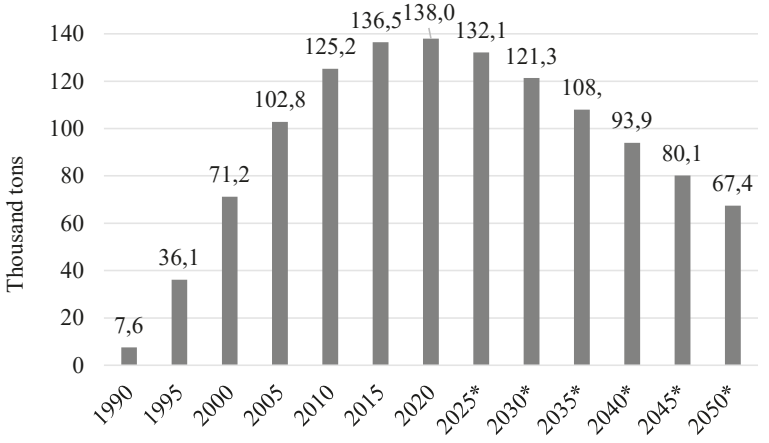

Fig. 3. Production of rare earths in China, 1990–2050

Source: authorsfrom [Statista, 2021].
Note: * — forecast values.

However, starting from 2019, the country had chosen to reduce the production of rare earth elements by 2050. The reduction is planned to be 67 thousand tons, which consists almost a half of production in 2020. This is primarily due to the conservation of own mines — in 2019 the Chinese government reduced quotas for domestic production of rare earths almost by 20 %.

At the same time, the Chinese share in global processing of rare earth metal ore into oxides, metals, alloys and magnets is steadily increasing — currently China produces about 90% of all magnets; this can be evidence of country's policy aimed to dominate in environmentally-friendly high value-added production with higher profits.

Along with decrease in domestic production, China is actively interested in new sources of rare earths elements outside the country, including the Arctic region.

[3] Kalvig P., Lucht H. Greenland's minerals to consolidate China's rare earth dominance? No green future without China. Feb. 25, 2021. URL: https://www.diis.dk/en/research/greenlands-minerals-to-consolidate-chinas-rare-earth-dominance (accessed: 10.12.2021).

The Kvanefjeldproject is the most widely known and discussed one and relates to the Chinese investment in rare earths extraction in the Arctic. Kvanefjeld is generally considered the world's second-largest rare earth oxides deposit. The reserves of mineral resources of Kvanefjelddeposit amount to around one billion tons, while rare earths are forecastto generate over 80 % of the project's revenue[4].

Therefore, Greenland can be considered an extremely relevant partner for China due to rich deposits of rare earths.

The Fraser Institute (Canada) annually determines the Policy Perception Index (PPI) for the extractive industries in countries and regions in order to estimate how friendly are local government policies towards these industries.

The PPI is a composite index that measures the overall policy attractiveness. The index is composed of survey responses to policy factors that affect investment decisions.

The examined policy factors "include uncertainty concerning the administration of current regulations,environmental regulations, regulatory duplication, the legal system and taxation regime, uncertaintyconcerning protected areas and disputed land claims, infrastructure, socioeconomic and communitydevelopment conditions, trade barriers, political stability, labor regulations, quality of the geologicaldatabase, security, and labor and skills availability"[5].

For Greenland, the Policy Perception Index score slightly increased in 2020 (compared with 2019) but experienced asharp decline in the policy ranking. This, in turn, resulted from the decrease in concern over protected areas, in quality of socioeconomic agreements, community developments, labor regulationsand employment agreements[6].

The situation may continue to change in this way: in April 2021, the Greenland left-wing party, which opposes the China-sponsored development ofrareearth deposit, won a majority of the seats in parliamentary election which doubted the future of the project.

The extraction of rare earths in Kvanefjeld is accompanied by extraction of radioactive uranium as a by-product, and their separation process is an extremely polluting. The negative impact on the environment was the

[4] A new Cold War: mining geopolitics in the Arctic Circle. November, 2020. URL: https://mine.nridigital.com/mine_nov20/arctic_mining_geopolitics (accessed: 10.12.2021).

[5] Yunis J. & Aliakbari E. (eds). 2021: 2. Annual Survey of Mining Companies, 2020. Fraser Institute.

[6] Ibid: 38.

main argument of opponents to mining activities, despite Greenland is interested in foreign investment in mining projects in order to diversify the country's economy, which currently primarily relies on fishing.

In addition, Chinese companies are actively seeking opportunities to control rare earth deposits in Nunavut (Canada), currently being the owners of zinc and copper mines in the state. In 2020, Shandong Gold Mining Corporation started the process of acquisition of the Hope Bay gold mine, owned by the Canadian company TMAC Resources Inc. In October 2020, the Canadian government initiated an audit of this deal due to national security concerns, and at the end of December 2020, the government blocked this deal for the same reasons.

Currently Russiais the second in the world by proven reserves of rare earth elements, while their domestic extraction is less than 2 % of global one. More than 90 % of rare earth deposits are concentrated in two regions of the Russian Arctic — the Murmansk region and the Republic of Sakha (Yakutia) (Fig. 4).

Fig. 4.Rare earth elements in Russian Arctic shelf

The production of rare earths in Russia is about 80–100 thousand tons per year, while only less than 5 % are processed.

The most of Russian rare earth ore is in the form of associated components, containing less than 1 % of rare earth metal oxides. Currently, almost 28 % of the domestic reserves of rare earths are extracted, while the share of ores they are extracted from stands for only 2 % of domestic reserves.

All rare earth elements extracted in Russian Arctic are loparite ores of the Lovozero deposit (about 40 %), and apatite-nepheline objects of the Kh-

ibiny group (about 60 %) in the Murmansk region[7]. It seems reasonable to focus on the Tomtor deposit in the Arctic zone of Yakutia, the proven reserves of which exceed all world's known ones. The beginning of this deposit exploration is planned in 2022–2023 and it is included intoState Programme "Development of industry and increasing of its competitiveness".

At the early stage, the key project stakeholders were the ICT group and Rostec. In 2019, the imposition of USA the new anti-Russian sanctions led to the Rostec's withdrew from the Tomtor development project.

Currently, only the Buranny area of Tomtor deposit has been explored. According to the initial assessment of the mineral resources of the area, at the end of January 2019, the resources were estimated at 13.2 million tons of ore with high contents of scandium, niobium, terbium and yttrium. The content of niobium oxide stands at 5.9 % and rare earth oxides — at 15 %, which corresponds to 0.8 and 2 million tons, respectively[8].

The Tomtor deposit also contains significant reserves of neodymium and praseodymium oxides, which are key elements of permanent magnets. The magnet production sector can be considered the most economically efficient among other sectors that use rare earth metals — it stands for about 80 % of the global market value of rare earths, but only about 30 % of the world's deposits [Kalvig & Lucht, 2021]. Consequently, the most promising and most investment-attractive are deposits that are ready to meet the demand of magnet sector.

The developing of the Tomtor deposit is planned to be accompanied by tax incentives for the investing companies, including a zero income tax rate for the first five years, and 10 % for the next five years, and reduced coefficients for mineral extraction tax[9].

One of the main reasons of delay of Tomtor deposit development is related to its remoteness from Northern Sea Route, which creates significant logistical challenges associated with transportation of ore to the processing plant [for prospects of Arctic maritime transport system see Kharlampieva, 2017]. The annual capacity of Krasnokamensk Hydrometallurgical Plant (Krasnokamensk city in Zabaikalsky Krai), which will be constructed to

[7] Production of rare and rare earth metals. Best Available Technology Information Technology Handbook. ITS 24-2020. Moscow: Bureau of NTD Publ., 2020. (In Russian)

[8] Rare and rare earth metals. Large investment projects in Russia. Portal for subsoil users, January 09, 2021. URL: https://dprom.online/mtindustry/redkie-i-redkozemelnye-metally-krupnye-investproekty-rossii/ (accessed: 10.12.2021). (In Russian)

[9] Tomtor deposit. Investment potential of the Arctic zone of Russia. https://arctic-russia.ru/project/tomtorskoe-mestorozhdenie/ (accessed: 10.12.2021); Tomtor deposit. Investproject. URL: https://nedradv.ru/nedradv/invetsp?obj=345e642bddc6b9e33d15a47e5805daab#about (accessed: 10.12.2021). (In Russian)

process the Tomtor depositore and to produce the compounds of rare earths niobium oxide, is planned to be 160 thousand tons by dry weight.

Currently, the main option for transportation of ore is its delivery to Khatanga city in the north of the Krasnoyarsk Krai, from there theshipment will be transported through the Khatanga port by the Northern Sea Route, and then by rail to Krasnokamensk city.

In general, the development of such a multi-stage project will contribute to the creation of a large steel and mining holding companies, meeting up to 10 % of the global demand on rare earth metals and niobium[10].

In order toboost the domestic demand, the Ministry of Industry and Trade of Russian Federation, similar to Chinese authorities, proposes to introduce a mandatory quota for state-owned companies related to the use of rare earth metals in various industries by 2025. At the same time, a subsidy for compensation of interest rates on investment loans in rare and rare earth materials sector, aimed to attract new investors, is considered to be a tool to support mining companies.

In February 2021, the Ministry prepared the amendments on the extension of schedules for mining companies related to reaching their full planned capacities no later than 2030, that, therefore, enables the extension of availability of such subsidies until 2030 (previously it was until 2025)[11].

In addition to subsidies for investment projects, the enterprises of the sector can also enjoy the reduced rates of mineral extraction tax and an additional rate-reduction coefficient for a period of 10 years since the project started, as well as the concessionary loans provide by Industrial Development Fund of Russia.

Conclusion

The analysis of research on rare earths allowed to conclude that currently China in order to maintain a leadership in rare earths processing is actively interested in the extraction of rare earth elements on the Arctic shelf. The Russian Arctic contains significant reserves of strategically important raw materials required to the development of green energy, including rare earth elements. The development of rare earth deposits in the Russian

[10] Public hearings will be held on the construction of infrastructure for Tomtor. Metal market news, November 26, 2021. URL: https://www.metaltorg.ru/n/9B0EEE (accessed: 10.12.2021). (In Russian)

[11] On approval of the Rules for the provision of subsidies from the federal budget to Russian organizations to compensate for interest rates on investment loans in the production of rare and rare earth metals with amendments and additions: official text: on condition of January 21, 2014. (In Russian)

Arctic is greatly challenged by logistical issues and by technology gap related to the extraction metals from ores. The situation has been worsened by anti-Russian economic sanctions imposed firstly in 2014 by USA and European Union countries. The vulnerability of the national economy to economic sanctions caused the diversification of economic ties, the so-called "pivot to the East". Russia is looking for new markets and areas for cooperation with eastern countries, particularly with China[Belozyorov, Sokolovska, 2020].

In this context, the Russian-Chinese cooperation in mining of rare earth elements in the Arctic should be guided by rational protectionist policiesof Russia. It concerns, in particular, the permission for Chinese companies to explore the deposits in Russian Arctic shelfwithout giving control over companies. Otherwise, there is a high possibility that rare earth elements will beprocessedexclusively through the value chain in China. At the same time, the Chinese-Russian cooperation in this area enables Chinese companies to overcome the negative effects of reduced domestic production quotas for rare earths.

This paper can be considered as a starting point for further study of Russia's strategic behavior, which should include both the enhanced cooperation with China under economic sanctions and the minimization of geo-economic risks in the Arctic region.

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ROLE OF CHINA IN THE DEVELOPMENT OF RUSSIA'S ARCTIC LOGISTICS SYSTEM: AN ANALYSIS OF THE RUSSIAN ARCTIC STRATEGY 2035

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The Russian Arctic Strategy 2035 aims to make the Northern Sea Route a world-class transportation corridor. This means that the annual normal operation of the Northern Sea Route will no longer be a subject of study. To realize this strategic plan, Russia has proposed an impressive infrastructure plan for land, sea, and air transportation. The completion of Russia's Arctic logistics system is also imminent. In this study, we discuss the status quo of the transportation infrastructure of the main ports along the Northern Sea Route, analyze the role of different transportation infrastructure, and deduce the future development trend of the Arctic logistics system in aid of Arctic shipping, economy and trade, tourism, and scientific research. The insights herein serve to promote the investments of Chinese companies in the Russian Arctic as well as Sino–Russian cooperation.

Keywords: Northern Sea Route, logistics system, Arctic transportation infrastructure, investment in the Russian Arctic, Sino–Russian cooperation.

Introduction

The Strategy for Arctic Development and National Security from the Russian Federation to 2035 (hereinafter referred to as the "Russian Arctic Strategy 2035") puts forth the ambitious goal of transforming the Northern Sea Route into a "world-class traffic corridor." Despite the implications and scale of such a project, Russia's ambition has attracted very little political or scholarly attention outside the region. In this study, we chart the discussion away from Western academia's evaluation of Russia as a "super gas station" disguised as a country and similar evaluations. Instead, we discuss the possibility of the Northern Sea Route becoming a world-class transportation corridor, the development of the Russian Arctic logistics and transportation system, and the role of China in this ambitious transformation.

The hastening of anthropogenic climate change means that navigation in ice-free waters during the summer may become a reality soon. Indeed, the winter icebreaker pilot liquefied natural gas (LNG) carrier has long been operational, and the section from Port Sabetha in the Yamal Autonomous okrug to Murmansk Port brings with it immense winter navigation experience. The Russian unmanned autonomous ice breaker tanker also completed its voyage from the mouth of the Ob River to the Cape Derzhnov in

January 16, 2021[1]. The report of this journey confirms the technical maturity of the eastward winter oil transport route and the possibility of its operation throughout the year. The Russian Arctic strategy is now planned in the ports along Northern Sea Route Highway 2035; every Russian Arctic state has been assigned the task of building a key Arctic port. The construction of Arctic submarine optical cables has also been laid enroute to Nenets Autonomous Okrug, with high-orbit satellite communication; together, these developments signal the realization of a digitalized Arctic logistics system in the near future.

Continued warming will lead to ice-free navigation throughout the year and make the Northern Sea Route the most important transportation corridor in the Northern Hemisphere. At this point, Russia *will* transform from a traditional landlocked country to a maritime power. In a sense, the Russian Arctic logistics system is a historical mission.

Russian Arctic Strategy 2035: Arctic Logistics Planning

*Federal Planning.*The Russian Arctic Strategy 2035 is conventional in regional security; little has changed from the Russian Arctic Strategy 2020. In terms of regional development, especially in the construction of Arctic transportation infrastructure, the planning of the 2035 strategy shows strong execution and measures related to building Arctic logistics, that is, developing port and sea infrastructure in the Northern Sea Route, Barents sea, White Sea and Pechora river waters establishing maritime business headquarters for shipping management in the Northern Sea Route waters; integrating traffic logistics services and creating a digital platform for multifunctional passenger and cargo transportation; and developing and implementing construction projects for cargo ships to aid sea transportation.

To implement certain economic projects, the strategy reiterates the need to build mixed human and cargo ships suitable for river–sea combined transport in the Arctic region; to ensure international and coastal freight transport in the Arctic waters; for construction of a port cluster and container business management centre; to raise the shipping capacity of the White Sea–Baltic Canal as well as the Onega, North Dvina, Mezen, Pechora rivers, Ob, Yenisei, Lena, and Kolyma rivers, among others, in the Arctic. This includes the dredging of rivers, as well as construction of ports and

[1] Decree of the President of the Russian Federation on the Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period up to 2035: official text as of 2020. URL: http://kremlin.ru/acts/news/64274 (accessed: 28.10.2020). (In Russian).

convenient port unloading points; to create a development blueprint; and for construction of airport clusters and border posts.

At the same time, it has been deemed pertinent to develop the infrastructure of the Northern Sea Route, and promote more economic projects; build and develop a high-elliptical orbit satellite cluster based on domestic equipment; ensure satellite communications between the Northern Sea Road and high latitude north of 70 °N. Concurrently, ensuring the speed and quality required by the automatic identification and the long-distance detection systems; establishing a submarine optical fiber optic communication line across the Arctic trunk line and output local communication lines to large ports and settlements in the Arctic; and formulating unified rules for foreign capital investment projects in the Arctic have been identified for development. Furthermore, taking measures to attract foreign investment in economic projects in the Arctic; conducting activities in the Arctic region; establishing and promoting a multilingual information resource network platform; and, finally, furthering the development project to establish the Indiga deep water port with the Sosnogorsk railway have been proposed[2].

The above planning is to take place at the federal level. A quick glance shows that river dredging, airport cluster construction, port construction, satellite communication in high latitudes, and submarine fiber communication lines are large national infrastructure investment projects that will support hardware facilities for the construction of Arctic logistics systems. Formulating unified rules for foreign capital investment projects, taking measures to attract foreign investment in economic projects in the Arctic region, and establishing a multilingual information resources network platform will further support software facilities for this logistics system.

At the same time, the future transportation infrastructure in the Russian Arctic region is not limited to land, sea, and air. The Russian Arctic Strategy 2035 aims to create an Arctic logistics system with river–sea, air, and railway transport systems with strong software and hardware development.

Local Government Planning. A significant difference between Russia's Arctic strategy of 2035 and 2020 is the planning of the local governments of the eight Russian Arctic states and the Republic of Karelia. Each Arctic local government has been entrusted with specific construction of transportation infrastructure.

For instance, Nenets Autonomous Region is tasked with developing transportation infrastructure, including the reconstruction of the Naryan-Mar seaport and airport and the Amderma airport, dredging of the Pechora river and building of the road from Naryanmar to Usinsk. Chukchi

[2] Ibid.

State is tasked with developing the Pevek (Chukchi Sea) seaport and its terminal facilities, building the transportation and logistics hub in the deep water seaport of Providenije (Chukchi Sea) throughout the year, and establishing a critical situation management centre and water search and rescue department in Pevek. The Yamalo-Nenets Autonomous Okrug is tasked with developing the freight terminal and Cape Kamennyi as well as building the railway line connecting Obskaya, Salekhard, Nadym, Pandogy, Novyi Urengoi, Korotchaev and Obskaya, Bovanenkobo and Sabetta. Republic of Karelia is tasked with the modernization of the White-Baltic Canal. Sakha (Yakutia) Republic is tasked with undertaking the systematic development of Tiksi town, including the development of dual-purpose infrastructure; the reconstruction of Dixie port and its terminal facilities; and the establishment of a critical situation management centre and water search and rescue department in Tiksi. Krasnoyarskij krai municipalities are tasked with developing Port Dixon and Port Dudinka, including the construction of new coal and oil terminal facilities, while Arkhangelsk is expected to develop raw material centres for lead-zinc mineral on Yuzhny island.

A common feature is that each local state government or republic is planned to build transportation infrastructure around a port or island that will connect land, water, and air transportation in the region that will eventually merge into the Russian Arctic logistics system.

The Russian Arctic Logistics Network

The Northern Sea Route occupies the core position in the Russian Arctic logistics network; however, this network includes water as well as land and air transport.

According to A. Kravchuk, the successful development of the North Sea Route, and the resulting Arctic shipping, will enable the Russian Federation to complete the construction of a unified national transport network. This network, in turn, will ensure the development of Siberia and the Russian Far East [Kravchuk, 2017].

Notably, the Arctic logistics network will be built before the unified national transport network, and become part of the unified national transport network of the Russian Federation. From the General Directorate for the Formation of Energy Infrastructure and Transportation Network in the Russian Arctic, Alexander Biev noted that "Of the total information of transportation, logistics, and energy projects registered on the Regional Investment Register, 151 projects were identified as pre-2025 projects. As of 2025, transportation and energy projects in the Arctic reached five trillion rubles" [Biev, 2017].

The two papers were published as early as 2017 on the construction of the Russian Arctic logistics network. The project is acknowledged for its considerable investment scale, but it has seldom been discussed as an integrated "Russian Arctic logistics system" [Kravchuk, 2017].

Air Transport. Air transport is Russia's current daily mode of transportation—since the Soviet construction of airports in the Arctic in the 1930s, and later the Russian northern urban airports in the 1960s. The central city of the Russian Arctic is only within 10 hours of Moscow, and Russia's Arctic airport is operational throughout the year.

The main airports in the Russian Arctic range from west to east: Murmansk, Severnaja Dvina, Arkhangelsk, Naryanmar, Amderma, Vorkuta, Salekhard, Nadym, Novyj Urengoj, Dudinka, Norilsk, Khatanga, Zhigansk, Tiksi, Batagay, Yakutsk, Igarka, Cherskij, Pevek, and Anadyr. Interurban passenger and freight flights in the above cities are operational, with more than 150,000 passengers traveling on daily flights to Moscow, and more than one direct flight per day. Cities with a population of 50,000 have at least two direct flights to large central cities a week.

In addition, the Arctic Ocean ports have heliports and cargo airports, such as Sabetta. Since 2015, Sabetta International Airport, a federal airport, has been an important part of the transportation infrastructure of the large Yamal LNG project.

The condition of Russian Arctic aviation services directly affects the safety of the lives and activities of local residents, as well as the exercise of civil rights. The problem of providing emergency medical aid in the far north and similar areas, for example, grew serious owing to an aging ambulance aid system that was first established in the erstwhile Soviet Union. The possibility of developing large Arctic projects, such as the North Sea Route and the North Transport Corridor, large hydrocarbon oil and gas fields, and industrial production in the Arctic, is largely dependent on the development of aviation services.

Thus, in 2014, the Russian government approved a new national programme, called the "Aviation Industry Development 2013–2025," under the Russian Ministry of Industry and Trade. It includes within it a "small aviation" programme for providing new aircraft needed for development in the Arctic region and will supplement the regional and local aviation service fleet by 2020–2025 [Gruzinov, 2019].

Aviation, as the fastest way of transportation, plays a pivotal role in the Russian Arctic. The Russian Arctic Strategy 2035 thus announced the construction of an Arctic airport cluster to replace old models, build runways suitable for light aircraft, and modernize the Arctic airport.

Land Transport. If Russia wants to develop the Arctic, it is far from insufficient to develop air transport alone. The transportation volume of railway and road transportation accounts for a larger proportion of logistics. While the climate conditions in the Arctic are detrimental to building large transportation infrastructure and there are further difficulties in maintaining such infrastructure, Russian governments still systematically plan roads and railways.

A large railway network, for example, will be built in the Russian Arctic by 2023, and it will span 686 km north, from Obskaya to Dudinka. The Severnaya Railway will connect to the Sverdlovsk Railway, while connecting the Arctic, Western Siberia, and Ural enroute. A high-latitude Arctic railway is also planned for other parts of the Russian Arctic. For example, the Mikun–Sosnogorsk–Vorkuta railway line will be built to connect with the Arctic Ocean ports, such as Arkhangelsk, Indiga, and Ust Luga. This will stimulate the transport capacity of the Northern Sea Route to a considerable degree [Fedorov, 2017].

Fadeev A., a senior researcher at the Kola Research Centre of the Russian Academy of Sciences, has stated that the prospects of Arctic ports will be bleak without long-distance railways. Thus, the development of sound transport systems andinfrastructure will not only exploit the transit transport potential to increase traffic accessibility to settlements, but can also largely eliminate the restrictions on growth of mineral production in the Russian Arctic. Undeveloped transportation and logistics systems, however, have become the biggest obstacles to the development of this region[3].

Water Transportation

River–sea Combined Transport. Water transport in the Russian Arctic includes two categories: river transport and Northern Sea Route. In the Russian Arctic Strategy 2035, the dredging of large rivers flowing into the Russian Arctic Ocean is planned to create a foundation for combined river–sea transport.

Note that the northern waterway is the lifeline of transportation in the Arctic and Siberia, especially for the export of natural resources. Consider the Suez Canal channel. Globally, it is the shortest route connecting Europe, Asia, and North America. As the climate warms, the capacity of the rivers in the Russian Arctic will reach their maximum, especially in the Lena and

[3] Fadeev A. 2014. Transport and logistics tasks in the Arctic and prospects for international cooperation. ProArctic. URL: https://pro-arctic.ru/04/04/2014/resources/7533 (accessed: 13.07.2021).

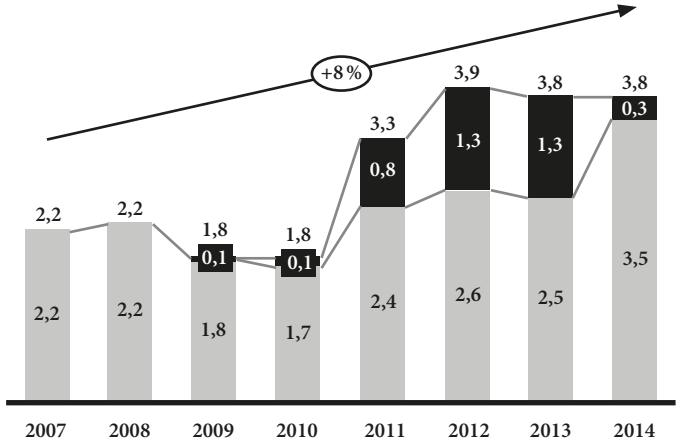

Fig. 3.1. Northern Sea Route Administration data. Freight unit: million tons
S o u r c e: Compiled from: [Gruzdeva, 2015].

three rivers that connect this dense waterway. The combined transportation capacity of the Arctic rivers and the Northern Sea Route (Northeast Channel) of the Arctic Ocean has within it great economic potential.

In Fig. 3.1, the deep blue parts show the transit transport volume, while the light blue parts show the domestic transportation volume in Russia. Affected by the Crimean incident in 2014, which led to anti-Russian sanctions by Western countries, the transit transport volume decreased sharply. At present, foreign companies using the Northern Sea Route are small in number, and the capacity of this route is mainly supported by domestic transportation needs. For reasons of sanctions and environmental protection, Western countries have resisted the use of the Northern Sea Route, while Chinese companies have used it to transport goods since the summer of 2013. As of 2020, they have completed 42 voyages. Nevertheless, the current freight volume of international shipping companies in the northern waterway is far from the vision of a "world-class transportation corridor" that Russia wants to build.

Suez Canal Alternative. As the climate warms, the advantages of Northern Sea Road will become increasingly obvious; some of these include savings in transportation time and costs, cheaper ice-free navigation in summer, better comparative costs against the Suez Canal, and reduced piracy. The competitive advantage of the Northern Sea Route is thus clear.

The Northern Sea Route scheme saves time and mileage, which itself reduces transport costs by a quarter lower compared with the Suez Canal scheme. Beyond this, the Northern Sea Route has no limit on the tonnage of

Table 3.2. **Cost comparison of 70,000 ton bulk carriers from Norway to Japan between the Suez Canal and the Northern Sea Route**

Cost indicators	Suez Canal route	Northern Sea route
Total fuel consumption	One million people totaled 44 days	601,000 totaled 26 days
Fuel is consumed daily	33 tons, $700 per ton	33 tons, $700 per ton
Total freight charges	$720,000 for 48 days	$450,000 for 30 days
Shipping rates per day	$15,000 a day	$15,000 a day
Suez Canal transit fee	US $250,000	None
Ice breaker fee	None	$375,000
Port service charge	US $250,000	US $250,000
Unexpected expenses (drag)	$50,000	$50,000
Additional insurance premium (protection against piracy)	$110,000	None
Additional insurance premium (Northern Sea Route)	None	US $70,000
Total	$2.38 million for 48 days	$1,796,000 for 30 days

Source: Compiled from *The cost comparison of the 70,000 ton bulk…*, *2015*[4].

the vessels. Large transport ships can greatly reduce costs of transportation, loading, and unloading, and thus achieve economies of scale [Wan, 2005]. The Suez Canal and the Strait of Malacca are located in politically sensitive and volatile areas of the world. Pirates in the Indian Ocean are very rampant, and the unstable situation in Syria and Afghanistan affects the normal operation of commercial ships. The Suez Canal is also narrow and easily clogged, as evidenced by news of the massive traffic jam on March 23, 2021 caused because of an obstruction by Ever Given, a 20,000 TEU container ship[5].

Climate change, which entails significant warming and melting of ice, opens up the Northern Sea Route, making the comparative advantage of the Northern Sea Route more obvious against the Suez Canal route. The former can now be considered a viable alternative to the latter for shipping companies.

[4] The cost comparison of the 70,000 ton bulk carrier to Japan, the Suez Canal route and the Northern Sea route. 2021. *Forbes*. URL: http://www.forbes.ru/sites/default/files/users/user12848/04_ed_infographic_0.jpg (accessed: 13.07.2021).

[5] Taiwan cargo ship Suez Canal stranded caused a major traffic jam. 2021. GMW. URL: https://m.gmw.cn/baijia/2021-03/24/1302187356.html (accessed: 13.07.2021).

Obstacles and Prospects for Developing the Russian Arctic logistics system

History. Russia's Arctic logistics system has a long history, but it is not known by this name. The idea to build a Northern Sea Route corridor first came about at the time of Peter the Great. Tsar Peter I founded Petersburg by the Gulf of Finland, and decisively moved his capital to St Petersburg, leaving open a "window towards Europe" for his descendants. Peter I visited the Arctic city of Arkhangelsk in 1693–1694, and 1702, and sponsored the Vitus Bering's Great Northern Expedition in his last years [Sakharov, 2018]. It has thus been a long inherited dream for Russia to become a maritime country.

On 13November1931, the General Administration of Far North Construction of the Ministry of Water Resources of the Soviet Union was established in the upper Kolyma area, and it engaged in all economic activities in the vast areas of the northeastern Soviet Union with the purpose of mining natural resources, first of non-ferrous metals.

On 17 December 1932, Resolution number 1873 the Soviet Council of People's Commissars stated that "… It was finally determined that the White Sea to the Bering Strait was equipped to keep it in good condition, and to ensure its safe navigation." Then, On 13 April 1932, the Soviet Council of People's Commissars issued a resolution on the construction of the Baikal–Amur Railway "under which the design survey was conducted and the construction of the road began" [Filin, 2019].

In the 1930s, Russia made three decisions to develop the Arctic transport infrastructure. It planned to build the transpolar railway line and parallel the section across Siberia further north (Baikal–Amur); develop highway and maritime transport; and establish long-distance aviation and air navigation. These developments in the Soviet era laid the foundation for the modern Russian Arctic logistics system.

Now, in the twenty-first century, Russia's maritime dream may finally manifest: The plan to develop the Northern Sea Route into a world-class traffic corridor in 2035 is not an impulsive policy, but has profound historical origin and realistic possibilities.

In recent years, President Vladimir Putin has also repeatedly expressed his ambition to develop the Russian Arctic. Russian experts agree that economic activity in the Arctic will be a priority for the next 30 to 50 years, with the vast majority of Russian gas reserves concentrated in the Arctic [Khodyrev, 2009]. With economic development, the construction of a supporting Arctic logistics system is also essential.

*Barriers.*The Russian Arctic Strategy 2035, while in line with the interests of Russia, has detractors in the West.Western countries have collec-

tively ignored the Northern Sea Route for complex reasons. Russia's Arctic logistics system is a precondition for the development of the Russian Arctic, and Western countries have long sought to limit Russia's ascendency as an economic and militarily power in the Arctic. Therefore, the completion of the Russian Arctic logistics system must overcome many obstacles.

Resistance from Western Countries. Of the eight Arctic countries, seven, except Russia, are considered part of the "West," that is, they are allies or quasi-allies of the United States. Russia has a long history of Arctic development, and the navigation conditions of the Northern Sea Route are the best in the Arctic waterway. So far, the other seven countries have resisted the Northern Sea Route, and this reflects the tense relations between Russia and the United States. As a world power, there is competition and cooperation between Russia and the United States; however, this cooperation is not enough to "ballast" bilateral relations. Structural contradictions dominate the nature of this bilateral relation [Liu, 2021]. In general, three reasons explain why Western countries, led by the United States, have resisted Russia's development of the Arctic: the economic sanctions in Crimea, economic development undermining the Arctic environment, and Russia's strong military strength in the region.

As the Arctic is a treasure house of resources, Russia has high hopes for resource development in the region, and hopes that it will trigger its revival. Western nations are also reluctant to acknowledge Russia's strength: The more the Russian economy improves, the greater a threat it becomes to the West, primarily because the West will consider this a means for Russia to upgrade its military facilities. These barriers may hinder Russia's national interests in developing the Northern Sea Route and Russian Arctic resources.

Lack of Funds. Infrastructure in the Arctic is costly and difficult to maintain, and developing it further in the short term is difficult with Russia's current national strength. The Russian Arctic Strategy 2035 has preferential measures to attract foreign investment, but few such companies are willing to invest in the Russian Arctic for current international capital or for political and policy reasons.

Since the Crimea incident, Russia has been subjected to sanctions by the West.The United States has taken this opportunity to suppress oil prices, affecting the Russian economy. Despite high hopes and dreams of a revival, the reality of funding Arctic infrastructure is more bleak.

Lack of Technical Support Industry for Logistics Management. Russia's Arctic region is vast and has an extreme, almost inhospitable, climate. At present, Arctic logistics management in Russia is limited to communications and security facilities. However, these are obsolete and create difficulties in communication and inefficiency in work. Effective management is

thus lacking. Also lacking are reliable, advanced security facilities expected by high-risk industries. Since Russia's industrial chain is still incomplete, technical obsoleteness and limitations will make any further development difficult.

Development Prospects

Although there are many difficulties in building the Russian Arctic logistics system, there are also the advantages that other Arctic countries do not have. Russia still has many unique conditions for Arctic development.

First-Mover Advantage. Russia's development of the Arctic has been in progress for more than 300 years since Peter I. Russia is a northern country, and the Arctic is just north of Russia. The country has advantages in terms of the geographic area, population, and development over other Arctic countries. Its military strength in the region also offers any Russian economic activity protection from other rivals.

Further, as a country where most of the land lies above permafrost, Russia has deeper knowledge of the climate and environment of the Arctic. Most of its scientific research is also published in Russian—outside the world's popular scientific evaluation system. Yet, Russia ranks high among the world in certain scientific fields. More importantly, it is already more active in the Arctic than other countries in the region or elsewhere.

Solid Foundation of the Soviet era. Russian Arctic development reached its climax in the Soviet era, when many Arctic cities rose owing to infrastructure for water, land, and air. Old roads laid out during the era are easier to repair and maintain than building new ones. Russia has also accumulated considerable experience in infrastructure construction through, for example, the High North Railway, which currently involves several high-latitude railways in construction.

Climate Change. Climate warming offers additional opportunity for Arctic development, given the expected extended ice-free periods. This will allow faster and easier construction of Russian transportation infrastructure.

Advantages of Russia's Arctic Logistics. Both air and sea routes across the Arctic are the shortest distances, saving a third of time and fuel, which is a major competitive advantage and avoids piracy. The world's major trading powers are in the Northern Hemisphere, and the Arctic has a unique geographical advantage as a result.

In addition, Russia has the world's most powerful icebreaker team, and the planning of the Russian Arctic Strategy 2035 strengthens this advantage. It provides technical guarantee for the all-year normal operation of the Northern Sea Route.

Role of Chinese Power in the Russian Arctic

As noted earlier, the Russian Arctic Strategy 2035 introduces a series of measures to attract foreign companies to invest in the Russian Arctic. Unlike Europe and the United States, Russia has stronger economic ties with Asian countries. South Korea, Japan, and China have especially expressed a demand for natural resources in the Russian Arctic.

In particular, China and Russia complement each other in their economic structure, and relations between the two countries are at a historical high. China has also declined to participate in sanctions against Russia; instead, it has chosen to strengthen its economic ties with Russia in recent years. China's "Belt and Road" strategy is also within the ambit of Russia's national interests; in September 2011, for instance, Russian Defense Minister Sergei Shoigu proposed a complementary "Ice Silk Road" during the second Arctic-Land of Dialogue International Forum in Arkhangelsk [Qian, 2018].

"China advocates the building of a community with a shared future for mankind; is an active participant, builder and contributor of Arctic affairs; and strives to contribute Chinese wisdom and strength to the development of the Arctic," states a white paper on China's Arctic Policy. Nevertheless, for China to participate in building the Russian Arctic logistics system, it must focus on three forces[6].

Enterprise. Attracting Chinese companies to invest in the Russian Arctic is a current concern for Russian governments at all levels. The natural gas projects invested in by Chinese enterprises in Yamal indirectly have enhanced the transportation infrastructure in the Russian Arctic and have promoted the formation of a logistics system in the Russian Arctic. In the Yamal and LNG2 projects, Chinese companies contracted the construction of some of these infrastructures.

In addition to energy projects, other natural resources in the Russian Arctic can also find a large number of partners in China: The Russian Arctic biological resources development projects could attract various Chinese food, healthcare, and traditional medicine enterprises, alongside with mineral resources development for precious metals and gems.

The investment and business exchanges of Chinese companies in Russia are closely related to the logistics system in the Russian Arctic. Through the Internet economy, high-tech equipment, and digital and intelligent systems, China has also formed a large logistics enterprise. In fact, it

[6] China's White Paper on Arctic Policy. 2018. The State Council of the People's Republic of China: official text: as of 2018. URL: http://english.gov.cn/archive/white_paper/2018/01/26/content_281476026660336.htm (accessed: 13.07.2021).

has the world's largest logistics market and system in the world[7]. This rich experience can be useful in ensuring that Russia's Arctic logistics system is technically advanced and efficient.

Scientific Research Institution. Despite the advantages, Chinese companies remain unfamiliar with the Russian Arctic. The knowledge of the geography, history, policies, regulations, and customs of this region is not comprehensive, and thus requires greater research, especially in the humanities and social sciences.

Further, a Chinese–Russian Arctic scientific cooperation offers scope for research in climate change, glaciers, and permafrost as well as better communication and remote sensing. However, this cooperation must comply with the national conditions and cultural traditions of both countries.

The construction of the Arctic logistics system also requires scientists to have a deep understanding of the effect of climate change on logistics infrastructure construction. This requires multidisciplinary cooperation.

Chinese Civil Society. The Chinese civil society is an active force in its economic activities. Examples include polar travel association and navigation association. The activities of these civil groups often manage to flow the latest information. Organising Chinese civil groups to investigate and hold activities in the Russian Arctic can effectively promote private investment in the Russian Arctic, including investment in Russia's Arctic logistics infrastructure.

As a near-Arctic country, China is a stakeholder in Arctic affairs. The Chinese government supports relevant Chinese departments and institutions to conduct Arctic activities and cooperation. China and Russia are promising directions for building an Arctic logistics system.

Support from China in Developing the Arctic Logistics System

Technology Support. China has the world's leading technology and speed in communication, highways, and high-speed rails, among others. Its logistics and distribution networks are also mature, spanning the land, sea, and air, allowing it a rich management experience. We know that logistics is already a bottleneck restricting the development of the Russian Arctic region, and China's logistics industry could help the Russian Arctic region realize its economic potential.

[7] Wang Y. 2021. Building a modern logistics system includes the key tasks of economic work in 2021. China Discipline Inspection and Supervision Daily. URL: http://qiye.chinadaily.com.cn/a/202101/04/WS5ff27b30a3101e7ce9738d0c.html (accessed: 13.07.2021).

Market Support. The logistics system serves market demand, and China has strong demand for various resources in the Russian Arctic. First, China has a large population, and its cities are densely and heavily populated as well. The medium- and high-income populations have also reached their highest proportion in history, which has increased the demand for high-quality products. Energy, minerals, fishery products, and bio-pharmaceutical products in the Russian Arctic are most attractive to China's consumer market at the moment.

Capital Support. As noted earlier, the Russian Arctic lacks funds and human resources. Chinese enterprises are increasingly saturated and face fierce competition, requiring both capital and labor. The Russian Arctic can provide these enterprises with new raw material supply locations, conversion bases for remaining capacity, and new marketing paths.

Conclusion

The ambitious Russian Arctic Strategy 2035 seeks to realize Russia's dream of becoming a maritime power through the Northern Sea Route. This route will depend on the country developing a high-tech, efficient, and reliable Arctic logistics system that is not only limited to the Northern Sea Road, but spans the land, water, and air distributions systems.

This project is not without challenges, especially given Russia's own limited national strength and fierce pushback from Western countries lead by the United States. In the East however, China is positioned to become a powerful stakeholder in Arctic affairs, and could lead the sustainable development of the Arctic along with Russia in a historic win–win partnership.

China's institutions of scientific, humanities, and technology are poised to strengthen comprehensive research on the Russian Arctic in order to lay a strong foundation for Chinese investments in this region.

Indeed, the hurtling change of climate brings new opportunities to Arctic development, and the Russian Arctic Strategy 2035, underpinned by the Northern Sea Road, may not be completely impossible, and allow Russia, with Chinese cooperation, to develop the North Pole.

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Chapter 3
INTERCULTURAL COMMUNICATION AND PUBLIC ACTION FIELDS

PROBLEMS OF ARCTIC RESEARCH IN THE SCIENTIFIC ACTIVITY OF THE DEPARTMENT OF INTERNATIONAL HUMANITARIAN RELATIONS OF ST PETERSBURG UNIVERSITY

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The research focuses on the richest cultural potential of the Arctic, its tangible and intangible heritage, as well as new projects that are successfully implemented in this region. Studying the Arctic's potential as a substantial territory of international cultural interaction is an important area of scientific and methodological activities for professors and students of the Department of International Humanitarian Relations of the Faculty of International Relations of St Petersburg University today. At the beginning of the 21st century, the department's research group produced an article series devoted to various aspects of cultural cooperation in the Arctic, which reflect the current trends of contemporary cultural exchange in the region. The studies highlight not only the results of international cooperation, but also show promising directions of cultural relations and reveal the role of intercultural cooperation for the preservation and promotion of the region on the international stage. This research aims at revealing the role of the Arctic studies in the research activities of the Department of International Humanitarian Relations of St Petersburg University to define further directions of scientific and methodological work of both professors and students.

Keywords: the Arctic, Arctic cultural heritage, Arctic studies, Department of International Humanitarian Relations, directions and forms of international cultural relations in the Arctic.

Introduction

In modern international relations, a special role is played by issues of social and humanitarian cooperation, which is carried out at the multilateral and bilateral levels and it is an independent and very important area of in-

ternational interaction. At the beginning of the 21st century, cultural and humanitarian cooperation became the most important aspect of international relations, the basis and "soft power" instrument in the politics of modern States, an image resource and a phenomenon with an economic, political background. In the modern world, humanitarian relations can be regarded as a guarantee of the stability of international relations, but, unfortunately, sometimes humanitarian relations become the basis of interethnic, intercultural, and religious conflicts. A similar understanding of cultural and humanitarian cooperation, its practical significance in the modern world and international relations is taken into account in the work of the Department of International Humanitarian Relations of the School of International Relations in the preparation of Bachelors and Masters of the *International Humanitarian Relations* Master's Programme of the School of International Relations.

The research and methodological work of the Department is carried out in several directions, which are reflected in special courses and elective disciplines, as well as in the research work of Bachelors and Masters. Lecturers of the Department specialize in the study of the humanitarian aspects of international relations, the methodology and methods of studying international contacts in the humanitarian sphere, the social and historical anthropology of humanitarian relations, the humanitarian aspect of the problems of ethnic and religious conflicts, the activities of international humanitarian organisations. Traditionally, the lecturers are of considerable research interest in issues of bilateral cultural cooperation, as well as the study of industry areas of the contemporary cultural and humanitarian dialogue, for example, sports, art, music, theatre, scientific, educational, tourist relations in the modern world and international cooperation.

The study of the theory, history, and practical aspects of the foreign cultural policy of modern States, sports diplomacy, intercultural integration can be called the original activity of students, undergraduates, graduate students, and lecturers of the Department.

In the Bachelor's Programme, the staff of the Department reads the compulsory discipline *World Cultural Heritage*, which, as practice shows, has determined the choice of research activities of many Bachelors and Masters involved in various aspects of the protection of the world cultural heritage.

In recent years, the lecturers of the Department have been working on relevant topics that are related to the study of the role of new information technologies in humanitarian cooperation. All courses of the Master's Programme and Bachelor's subjects are provided with scientific and methodological literature prepared by the researches of the Department.

The Programme aims at training professionals who are able to quickly and efficiently carry out expert assessments of various difficult situations in international humanitarian cooperation and to forecast various initiatives of the Russian Federation in the field of cultural and humanitarian activities.

In the modern world, issues of cultural and humanitarian cooperation are acquiring special significance, acuteness, and relevance. Humanitarian cooperation has its own laws of development and plays a very significant role in modern political and economic cooperation. Today, we feel the transformation of the role of culture, cultural contacts in international relations. Culture becomes not only an instrument for solving many international problems, an independent value, but also the basis of political, economic cooperation, and at times, the guarantor of stability of life on the planet.

The value of cultural ties and their role in the modern world and international relations are obvious today. In this regard, there is a need to study consistently the mechanisms, directions, and forms of cooperation in the framework of special and general courses offered to students of Bachelor's and Master's Programmes of the School of International Relations.

Method and Data

The research methodology involves an extensive list of methods reflecting the interdisciplinary nature of the international relations science. The International Humanitarian Relations ("Международные гуманитарные связи" in Russian) programme relies on the recognition of the universal condition for humanity presented in the UN Millennium Declaration and UNESCO Declarations on the principles of international cultural cooperation and preservation of cultural diversity as its science-based criteria in the assessment of international humanitarian cooperation. Students of the master's programme "International Humanitarian Relations" are taught following classical, proven and new methodological approaches, taking into account the unique opportunities provided by the resources of St Petersburg University and the Faculty of International Relations.

Results and Discussion

The Arctic is one of the regions of great interest to professors and students of the Department of International Humanitarian Relations of St Petersburg University, with its enormous cultural, natural, and intellectual potential. Cultural exchange in the Arctic is developing intensively, being

implemented at multilateral and bilateral levels in various directions and forms. In this regard, international cooperation in the Arctic is broad and diverse, providing researchers with a wide scope for scientific research.

There are three most important areas of international cultural and humanitarian cooperation in the Arctic, which are also reflected in the scientific research of the Department of International Humanitarian Relations of St Petersburg University: 1) preservation of natural and cultural heritage (tangible and intangible), 2) sports cooperation and sports diplomacy in the territory of the Arctic, 3) the sphere of art represented most clearly in the festival form.

Preservation of Natural and Cultural Heritage of the Arctic

The Arctic has a rich and unique cultural heritage. It is home to more than 30 minor indigenous peoples (Saami, Nenets, Khanty, Mansi, Enets, Dolgans, etc.), whose culture, ways of life and traditions require special attention. No wonder that the problem of preserving the cultural heritage of the Arctic traditionally occupies an important place among the research works of professors of the Department of International Humanitarian Relations. The World Cultural Heritage textbook [World Cultural Heritage, 2014], recommended for undergraduate students, as well as a number of articles in Russian and English, are devoted to this topical issue.

It has been repeatedly noted in the works of professors of the Department of International Humanitarian Relations of St Petersburg University that the problems of preserving cultural and natural heritage are of particular importance for the Arctic. Their solution depends on maintaining the stability of the region, its ecological situation, and the consistent development of its natural and cultural potential [Bogoliubova, 2020].

International cooperation in preserving the natural and cultural heritage of the Arctic is studied at the department in many areas: identifying, researching, and protecting invaluable objects. Thus, the main partner of Russia is the international organisation UNESCO. Cooperation between Russia and UNESCO in the field of "Arctic issues" is analyzed in detail in the article "The Cultural Heritage of the Arctic in the foreign cultural policy of Russia" ("Kulturnoe nasledie Arktiki vo vneshnej kulturnoj politike Rossii" Russian) [Bogoliubova, 2011]. The authors acknowledge the success achieved. Three natural sites of the Russian Arctic have been included in the UNESCO List within 8 years: the Natural System of Wrangel Island Reserve (2004), the Putorana Plateau (2010), and the Lena Pillars Nature Park in Central Yakutia (2012).

The natural heritage of the Russian Arctic is represented by three sites on the UNESCO World Natural Heritage List. Researchers from the Department of International Humanitarian Relations believe that the vast potential of the Arctic is not limited to natural heritage sites. There are many cultural sites among the unique Arctic heritage, and their inclusion in UNESCO's area of responsibility would contribute to their better preservation and popularization. For example, the Murmansk region hosts one of the largest centres of ancient rock art in Northern Europe, the Kanozero Petroglyphs archaeological complex, by far the largest concentration of petroglyphs in all of Europe and one of the top five Neolithic monuments in the world [Bogoliubova, 2019].

The preservation of intangible cultural heritage also falls within the sphere of academic interests of the Department of International Humanitarian Relations. Unfortunately, the cultural wealth of the indigenous peoples of the Arctic is currently represented by only one object on the List of Masterpieces of the Oral and Intangible Cultural Heritage. The Yakut heroic epos of the Olonkho people received this status in 2009. However, according to experts of the Department of International Humanitarian Relations, the Arctic has other cultural assets, which could take its proper place in the World Heritage List.For example, the gastronomic traditions and national dishes of the indigenous peoples of the Arctic. Many countries are now actively promoting their national gastronomic traditions, treating them as an instrument of soft power [Bogoliubova, 2017 a]. Being a nation that is working hard to improve its image in the world, it is crucial for Russia to cherish the cultural heritage of the Arctic region and to promote it as a unique world heritage site.

Sports Cooperation and Sports Diplomacy in the Arctic

Professors from the Department pay much attention to the problem of sports cooperation in their research. The Arctic can be referred to as a territory of sports diplomacy, as many international sports events are held here, bringing together a large number of participants from different countries. For example, Krasnoyarsk successfully hosted the XXIX Winter Universiade in 2019.

Sports competitions held in the Arctic are considered by the Department of International Humanitarian Relations to be significant socio-cultural events, as they help in promoting and popularizing the sports of minor Arctic indigenous peoples [Nikolaeva, 2020]. The largest among them is the Arctic Winter Games held in various cities of the circumpolar zone once every two years. Russia is traditionally represented by the Yamalo-Nenets

Autonomous Okrug (YaNAO) at these games. The Games programme involves traditional competitions of indigenous peoples, the so-called "Arctic multiathlon" [Nikolaeva, 2017].

International sports events in the Arctic region are of paramount importance. They increase the visibility of the Arctic and have a positive impact on relations between countries and people. Particularly, series of articles on sports cooperation in the Arctic point to the positive impact of international sports events in the region on relations between countries and people.

A separate research area of the representatives of the Department of International Humanitarian Relations on the Arctic sports is associated with the study of national sports of minor indigenous peoples of the Far North, their place among the cultural heritage of Russia and the world. Among the diversity of cultural heritage, sports games of indigenous peoples occupy a special place. Despite the harsh climate and specific natural conditions, the sports palette of the Arctic is unusually rich and diverse. There are 240 national sports and games in Yakutia alone.

The search for strategies to improve the status of traditional sports in the international arena is an essential condition for the viability and development of an ethnic group and a way to preserve the ethnocultural identity of indigenous peoples through everyday practices and attitudes that use the culture and language of these peoples. International recognition also plays a significant role in the involvement of young people in sports.

It is important to continue to pay attention to the popularization of national sports through the creation of a system of relevant competitions, festivals, sports events. It would be desirable that such competitions have not only regional fame, but all-Russian and even international, that they to be broadcast on all-Russian channels, and in order to increase interest in their promotion, it is necessary to attract well-known media figures: athletes, artists, politicians. All this will ultimately contribute to the development of the Russian Arctic as an advanced cultural and sports region with a developed system of international relations.

Cooperation in the Arts. Arctic Festival Space

Festival cooperation is carried out with the greatest interest in the Arctic region. Festivals in the Arctic provide an opportunity to consolidate international cooperation and a way to promote the region's rich heritage. A variety of festival projects are held here: specialized, multi-genre, one-off or organised events on a periodic basis. The festival range of the Russian Arctic includes the festival called "Teriberka. New Life" ("Teriberka. Novaya Zhizn" in Russian), the international youth festival of folk art and multi-

media "Young Arctic" ("Molodaya Arktika" in Russian) and others. Thus, the aim of the festival "Teriberka. New Life", named after the village on the Kola Peninsula on the shores of the Barents Sea, is to reveal the unique tourist potential of the area at a global level and to develop event tourism in the Arctic zone of the Russian Federation. This festival is distinguished by its gastronomic programme, which introduces the intricacies of the local cuisine. Festivals have a significant public resonance and contribute to the discussion and solution of urgent problems in the region. In addition, they provide a very effective tool to promote the culture of indigenous peoples. This topic is the subject of scientific research by the professors of the Department of International Humanitarian Relations [Bogoliubova, 2017 b].

The professors of the Department are constantly developing new topics related to cultural and humanitarian cooperation in the Arctic. One of the emerging and promising topics is the study of Arctic tourism, which is gradually developing and gaining followers.

Arctic Tourism

Arctic tourism is a new, but dynamically developing in recent yearsphenomenon. At the beginning of the 21st century, there was a surge of interest in visiting the Arctic. The development of Arctic tourism creates the need for the development of new and modernization of existing infrastructure. This is especially true for transport infrastructure due to the remoteness of the region. The uniqueness of the Arctic as a territory of tourism lies in the fact that there is an opportunity for the development of not only Arctic tourism as such, but also many other types of tourism: natural or ecological, sports or extreme, cultural, educational, ethnic, gastronomic, eventful. The Arctic has a very significant tourist attraction, which is based on its unique geographical location, natural and climatic features, rich wildlife, interesting cultural and natural heritage, and rich cultural traditions. Prospects for the development of Arctic tourism are discussed in a joint article by the professors of the Department [Egoreichenko, 2020].

Currently, the research group of the Department of International Humanitarian Relations of St Petersburg University is involved in interdisciplinary research with the Department of World Politics of St Petersburg University, as well as the Arctic State Institute of Culture and Arts [Kharlampieva, 2018]. A series of articles were prepared for the journal "Culture and Art of the Arctic" ("Kultura I Iskusstvo" in Russian) [Matveevskaya, 2020], as well as reports were made at international conferences. This direction of scientific cooperation will be developedfurther.

Conclusions

Scientific interest in the problem of cultural cooperation in the Arctic allows us to note new tendencies and current trends in contemporary cultural and humanitarian cooperation, which is currently getting enriched with highly interesting, peculiar and original examples of intercultural dialogue in the promising and extremely important Arctic region for our country and the entire world community. The scientific potential of the Department of International Humanitarian Relations in the field of Arctic studies allows us to consider it as one of the leading research centres in this direction.

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MAN AND NATURE IN ETHNOPHILOSOPHY OF INDIGENOUS PEOPLES OF THE NORTH

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The author considers the socio-philosophical discourse on the construction of models of human and non-human interaction, embodied in the spheres of modern ecological and material cultures. This topic allows us to understand the modern representation of the human activities in northerners' society space of normative and spiritual culture. The ethnic consciousness of the indigenous peoples of the North as the basis of the value and truth of the existing world are represented through ethnophilosophy. The northerners' religious and mythological picture of the world is given within the boundaries of understanding representatives of modern European philosophy.

Keywords: Indigenous Peoples of the North, socio-philosophical discourse, ethnophilosophy, Nenets, Evenks, Ngnasans, Eskimos, Ketas, Selkups, Ents, picture of the world, Earth, soul.

One of traditional goals of social and philosophical discourse is to build models of interaction between the man and the nature in the spheres of ecological and material culture and social activities that connect the man and the community in the space of regulatory and spiritual culture. Ethnic awareness creates and justifies highest sanctions that state values and validity of the existing order in the world. Study of the forms of its reflection in ethnophilosophy helps to determine basic principles of social regulation expressed through the mythological and religious world view and represented in various prolegomenons of the contemporary Western philosophy.

An important trait of social existence in traditional type communities was ritualization and mythologization of all areas of human activity. In the concept of P. A. Florensky, the triplicity of the forms of human activity is represented through the following spheres: theoretical (world view); practical (household); liturgical (cult). The latter (theurgy) is considered to be the original nucleus from which in the process of desacralization all forms of social existence and human activity singled out as autonomous areas which used to be an integral and distinct theurgical whole.

Modern processes of transformation of values and attitudes of ethnical groups in the industrial and post-industrial context question the very existence of ethnic groups as stable social units. Thematization of ethnophilosophy as a conceptual model reflecting interaction of the archaic nucleus of ethnic memory and contemporary mechanisms of social regula-

tion of ethnicity allows demonstrating the transformation of traditional world-viewing outlooks as a process of overcoming the critical state of ethnic groups.

Today, concepts of stable development of indigenous minor peoples of the North are actively developed in world order scenarios in which the problem of preservation of the traditional environment of Northern ethnic groups and their traditional nature management plays an important role [Popkov and Tyugahev, 2006].

The most important part in scenarios of stable development of indigenous minor peoples of the North is given to revival and study of traditional spiritual culture of Northern communities; the nucleus of this culture is the sacral tradition and ethnical philosophy originating from it.

Image of the Earth in Northern Mythology

For a religious person, nature is always sacral since the Earth, as well as the Cosmos itself, is of godly origin. The created world is saturated with holiness. This is not about the holiness of certain places where people find hierophanies. The Earth is a sacred place because it was created in illo tempore, the Ecumenial Mother and Benefactress. In this image, the concept of the nature in relation to the man is revealed.

The image of the Earth exists in all religions all around the world, from archaic ones to world religions. Terra Mater or Genitrix is an underlying image in all myths, from cosmogenesis to eschatology [Eliade, 1994].

Ideas of self-sufficiency of the maternal beginnings also exist in the Samoyedic mythology. A widespread Nentsy cosmogenesis myth says that in the beginning, there was only the world ocean in which a single loon swam. "God decided to create the land and people and ordered the great bird (loon, or diver) to dive into the water and take land from it. But the great loon could not lift the land. Then God sent the small loon. It dived deep into the ocean and stayed there for three days. When it came to the surface, blood showed on its beak, but together with blood, there was liquid ground. It began to grow rapidly and shortly formed an island where trees began growing with similarly high speed. When the island became large, God created first people, a man and a woman" [Dunin-Gorkavich, 1904].

The image of all-begetting mother in the Nentsy pantheon is represented by the goddess Ya'miunia. This name is made of two roots: 'ya' which means earth and 'minia', a derivative of the verb 'mis' — to make, craft, produce and, as Tereshchenko N. notes, to "make as it is meant to be, give a proper form" [Tereshchenko, 1965]. Thus, the name of Ya'minia can be translated as 'the one who holds the world (earth) in place'.

The Nganasans have a clearer concept of the Earth as a self-sufficient deity. Their mythology still preserves relict ideas of the Earth giving birth on its own, without the male beginning. It has always been "filled with 'eyes' ('embryos') that it put into the bodies of women (females). They in turn gave birth to flesh which the Sun filled with life and made grow" [Gracheva, 1983].

The term 'earth' in both cases should be interpreted in a broader sense than simply 'substance' or 'begetting beginning'. Goddess Ya'nebia — 'Mother Earth' or 'Ya'minia' — 'Earth's Bosom' are gods of space. The root 'ya' can also be translated as 'ecumene'.

In the mythology of the Evenkis, the word 'earth' comes from the word 'buga ~ bua ~ boa ~ ba. In Tungus-Manchurian languages it means not only the Universe (the Overworld, the Middle World and the Underworld) and the sky, but also the nature, the weather, the taiga, all the space outside the tent.

The Evenkis notion of buga was once connected with ancestral relics. "According to the Evenkis, each clan had an ancestral relic — 'bugady'. In this case it is something related to the clan's land — rocks or cliffs with a zoomorphic form or trees with an unusual appearance or form. Such objects of the ancestral cult were considered to be the places where female spirits — the lady of the ancestral land called dune mushunin and the mother of the clan called bugady emintyn — dwelled [Anisimov, 1959, p. 33].

The Nganasan mythology has a concept similar to bugady of the Evenkis — ngo ~ nguo ~ ngua. Gracheva G. consideres that this notion is polysemic to the 'buga' of the Evenkis. "It (ngo) is used in the meaning of 'the sky', 'the canopy of heaven', 'the air' or 'the weather'. In particular, being a word-constructing morpheme, it has two meanings of the greatest interest for us that can be characterized as a measure of outer form, outer space, appearance and as a measure of collectivity, unification. Paired with other nouns or without them, the Nganasans translate 'ngo' as 'god'" [Gracheva, 1983, p. 6]. Thus, Ngo-Niamy, "Mother Earth" can be interpreted both as a protector and as a spirit of a certain territory.

Another important aspect related to the words 'ya', 'buga' and 'ngo' is a sacral level of territory, the land that is considered a part of the cosmos. Here originates the concept of borders beyond which, there is the word of chaos. All these spaces can be called real because people can orient there since they have a starting point. Besides, they are blessed with the celestial presence.

One more function of the Mother Earth to be addressed to in greated detail is a concept of all-begetting and preserving power.

According to some data, goddess Ya'nebia — 'Mother Earth' or 'Ya'minia' — 'Earth's Bosom' is the wife of Num, the supreme deity in the

Nentsy pantheon. It is she who helps during labour, accounts for people's lifespans and "deals with the fate of a born person until their death" [Vasiliev, 1976, p. 21]. In the Enets pantheon, the closest goddess is Dia-meniu'o — 'Old Woman of the Earth'. She has the functions of the maternal goddess who begets and guards all living beings. She is also in charge of birth: according to some data, she keeps the souls of yet unborn babies and sends them to our world with sunrays. Dia-meniu'o keeps the book of destinies, heals diseases, in the form of the miad'pukhutsia doll guards the house, hearth, children and families, teaches girls who reach marital age to sew. Ylenta-kota also gives cradles to newborn children, coffins to the dead, attires for shamans and rings for their drums.

There is a belief related to the concept of the all-begetting and preserving function of Mother Earth in the Nentsy culture: each visitor of the Ya'miunia shrine on the island of Vaigach must leave something near the rock of Nevehege associated with the earth's bosom. Islavin says that "people throw various coins, rifles, axes, knives, buttons and other objects to it… like a mother, it keeps everything in the bosom" [Islavin, 1847, p. 118]. The tradition is that people bring their sacrifices and take their gifts there. Such gifts may include, for instance, teeth from bear sculls brought there which fall out on their own used as talismans. From here people take ribbons 'the Old Woman's belts' that must be in every tent. This belt, as well as an image of miad'pukhutsia guards birth, life and death of every person [Golovnev, 1995].

Other peoples have similar goddesses being in charge of birth and life. According to the mythology, Tomam, a Ket deity, stands on a cliff every spring and scatters flocci from her sleeves, thus creating innumerable flocks of feathered birds [Anuchin, 1914, p. 7]. Sedna of the Eskimos is an underwater mistress of marine game; she lets marine animals from her tent with the same purpose [Bogoraz-Tan, 1936, p. 41].

These images of goddesses of the Earth and all living beings have other peculiar traits, 'incarnations'. They are all portrayed not only as preservers of all life, but also mistresses of the underworld and death. In the Nanaian myths, the mistress of the world of the dead helps shamans to guide the dead to another world. The Nivkhs believe that on the way to the world of the dead, "a woman standing in the middle of the road" meets the dead [Shenberg, 1936, p. 330].

In many myths, Ya'miunia is portrayed not only as Num's wife, but often as the mother of Nga. Therefore, she owns the Underworld (she is often portrayed riding a mammoth), the Earth (she is a mistress of the tent) and the Heaven (she is Num's wife and Num Nebia — 'the Heavenly Mother'). She is not only the Bosom giving birth to all things, but she also takes all things away. She begets both life and death in the image of Nga.

The concept of the Earth being an all-begetting mother in cosmogenesis myths was reflected in the belief that the earth is alive. Perhaps therefore the original meaning of the Nentsy word 'ya' can be 'the original substance'. The Nentsy mythology says that the earth is born from material prima, i. e. live matter; but this matter is not organised, it is a part of the chaos, not the cosmos.

It is this 'live earth' that creates all things. According to the mythology of Northern peoples, the 'prime substance' gives birth to the whole world and to people as well.

Human Soul

When analyzing the folklore of Northern peoples, several souls can be distinguished without which a person cannot exist.

According to the data of Gracheva G., the vital elements of the soul are given to people and all animals by the Mother Moon — Kygada-niamy. Although giving everything necessary to the newborn, she does not take part in his growth [Man and nature…, 1976, p. 47]. The Nentsy believe that life is given to people by Num; he determines the duration of human life and his destiny. "As early as at the time of birth, Num is said to set the time of his death; the invisible record was kept by Ya'miunia, the mistress of the earth. Ya'miunia was portrayed as an old woman who helps during labour and deals with the fate of a born person until his death" [Man and nature…, 1976, 1976, p. 21]. It is important to note that the Moon and the Sun were considered by the Nentsy and the Enets to be the eyes of Num; the Sun is the good eye, the Moon is the evil one [Eliade, 1994, p. 131]. The Selkup also believe that souls are given to people by the Sun. "It is only when a beam of sunlight falls onto a woman, a new life is conceived inside her — a baby. The Sun not only conceives a new life, it is also able to bring the dead back to life. The Selkup folklore has frequent mentions of a hero killed by his enemies and brought back to life. His body is put onto a white reindeer skin at the sunny side of the tent. In the morning, when the sun rises to the height of ends of a bow, its first rays fall onto the dead hero and revive him" [Man and nature…, 1976, p. 107].

According to ethnographic data on Samoyed peoples, a person has four clearly distinguished souls: a soul that in some cases can be associated with mind, breath, shadow and blood.

The Nganasans called the soul responsible for psychic functions 'nilti'. It was shaped like a bird and went to the heaven after death to be subsequently reborn. The Nganasans connected this soul with the eyes. Not unlike nilti, "eyes are given in mother's womb. According to other data, eyes are given by

Niamy-ngo (Mother Sky) or Mou-niamy (Mother Earth), i. e. one and the same deity. Records made by Dolgikh B. support this version: Mou-niamy gives eyes to all living things" [Doglikh, 1968, p. 216–222].

The mythology of Kets has a notion similar to 'nilti' of the Nganasans. The Kets believe that all living beings have 'etles' — vitality. "Explaining this concept, Tyganova O. gave the following example: a mortally wounded beast raises its head to the sky and its etles leaves its body and flies up to the sky. Etles is a trait of all breathing beings, but it is not breath as such. The latter has a separate name 'il'" [Man and nature…, 1976, p. 95]. In the language of the Kets, 'il' is also a shaman song, and in Samoyed languages this root is connected with such concepts as 'life', 'alive'. The Selkups called the soul 'ilsat', i. e. 'that which makes the life'. The name of the soul is similar to the word denoting a sunray. "During the life, a person's soul-breath is gradually spent, becomes shorter and shorter and finishes completely. One of his souls rises up to God right away, the other exists underground until it turns into a spider and rises to the sky" [Peoples of Western Siberia…, 2005, p. 375].

The Nganasan mythology considers soul closely connected with breath. According to the data of A. A. Popov, the concept of soul 'nilti' is not possible without 'batiutu' — the breath of life portrayed as threads coming from the heaven and connecting all people to the creator of the world.

The Enets believed that the main soul is beddu — breath, dwelling in the stomach area. When a person dies, his soul-breath is the first to leave the body and rise to the heaven to Nga, though not right away but after a certain period of time.

Thus, the following conclusions can be drawn: first, this soul is connected with the heaven, mostly with the Sun or the Moon since it is given to people by the Sun or through it and leaves to the Moon to be reborn after death. Second, souls can turn into spiders (according to ethnographic data, similar beliefs were typical also of the Nganasans and the Nentsy).

Eliade M. points out that solar and lunar cults in all cultures are connected with symbols of death. Because of 'birth', 'death' and 'resurrection' of the Moon, people managed to become aware both of the way of existing in the cosmos and of the possibility to be reborn. "Thanks to the lunar symbolism, religious people were able to bring large groups of facts with no apparent connection together, ultimately uniting them into a single 'system'. The majority of ideas concerning cyclicity, dualism, polarity, opposition, conflict as well as reconciliation of opposite things, of *coincidentia oppositorum* were either discovered or clarified due to the lunar symbolism. One can even mention 'metaphysics of the Moon' as a clear system of 'truths', a certain way of life, everything that takes part in the Life of the Cosmos, i. e. formation, growth, 'diminution', 'death' and 'resurrection'. One must remember that the

Moon reveals to religious people that Death is inseparable from Life, but at the same time, *Death is not final — it is followed by a new birth*" [Eliade, 1994, p. 100].

The Moon has great religious meaning for forming and generalization of knowledge of the space, it also makes a person reconcile with Death. On the other hand, the Sun reveals another way of existence: it does not take part in rebirth. It stays the same, always has the same form. "Solar Epiphanies of gods of sun in some cultures became a sign of intelligence. The Sun would ultimately be *associated with intelligence*" [Eliade, 1994, p. 102]. Therefore, combining the Sun and the Moon in the symbolism of death allowed people to unite two seemingly opposite origins of all living things: eternal changing of the world and the desire to halt the time (to return to the time of the Golden Age).

The image of spider is undoubtedly connected with threads going down from the sun and connecting it with the man. 'Threads of life' have axial meaning; ascension of the soul along such threads like ascension onto trees or poles made by shamans during their journeys stands for the process or returning to the Arche [Genon, 2004]. On the other hand, the spider is connected with weaving which brings us to the symbolism of the knot and the maze. Knots are in a sense binding and unifying things, they can be considered a symbol of transition. "A person going through the maze or a similar image finds the 'central place', i. e., from the point of initiative self-actualization, his own centre; passing itself is likely to be a representation of multiplicity of states or modalities of the manifested condition which a person had to 'wander' along before settling himself in such centre" [Genon, 2004, p. 410].

Similarly to the way life is not possible without the soul-breath, it is also impossible without blood. The Nganasans believed that kam — blood — is the same thing with the soul. Life leaves the body with it as well as with breath. Blood contains vital powers and therefore it is the sacrifice most desired by the gods (the Nentsy and the Nganasans would often spread blood of sacrificed animals on mouths of their idols); apparently it is for this reason that the planks of a 'cleansed tent' were smeared with blood to keep evil spirits away. The Nganasans believed that consuming blood would give a person power and it was considered a sin to let blood out when killing a domestic animal, therefore deer were slaughtered only by strangling. "This taboo was so respected that the Nganasans sold their deer to the Russians and the Dolgans only in the conditions that those deer would be strangled and not knifed. However, they had to spill blood when hunting wild reindeer, hence come different taboos concerning desecration of blood. For instance, it was prohibited to tread on blood of killed animals, otherwise they would

cease coming" Man and nature in religious concepts of peoples of Siberia and the North (second half of 19th — early 20th century), 1976, p. 32].

The Enets called soul-blood 'ki' and had similar taboos with the Nganasans. After death, such souls left into the ground because they were heavier that soul-breath and went to the evil god Todote who devoured them [Peoples of Western Siberia…, 2005, p. 375].

The Nentsy called soul-blood 'hem', this word denoting a concrete notion: a person or an animal can die due to loss of blood. Moreover, the Nentsy believed that blood had no taboos like those described above [Peoples of Western Siberia…, 2005, p. 473].

Thus, blood is a 'backbone' of all vital powers of the body. It is one of the channels connecting the organic body with 'tenuous' conditions of a living being which are often collectively referred to as 'the soul' — the word pointing out the principle of giving life to a living creature. "Indeed, even from the point of view of basic physiology, blood conducts heat inside the body. On the other hand, in fire itself, light is the highest aspect whereas heat is the lowest one" [Genon R, 2004, p. 77]. Therefore, we can say that the soul-breath and the soul responsible for psychic conditions of a person is related to the highest aspects of creation and moves to its centre whereas the soul-blood connected with the fire element is a part of 'crude' manifestations of the world and for this reason it ends up in the world of death.

The Samoyed peoples have somewhat dimmer ideas concerning the sul-shadow. The Selkups call it 'ilyntyl tika' (living shadow); it is clear from the translation that a dead person has no shadow. Reports of Kim A. show that each person has a soul-shadow; it accompanies people everywhere always being close. After its carrier dies, it becomes a shadow spirit and goes to the world of the dead [Kim, 1996, p. 140].

The Kets believed that a person in a compulsory unity of two halves: a visible half and an invisible one. The Nganasans believed that if one 'kills' a person's shadow (i. e. stabs it with a knife), such person will die. As Popov A. says, photography was considered a theft of soul. "The Vadeyevsk Nganasans showed a similar reaction to recording as well" [Man and nature in religious concepts of peoples of Siberia and the North (second half of 19th — early 20th century), 1976, p. 17:33].

The Nentsy had two words expressing the concept of shadow: 'tid' — shadows of inanimate objects — and 'sidiang' — shadows of people. "The stem 'sidia' — 'two' — can be seen in this word, thus, 'sidiang' means 'doppelganger'. 'Sidriang' is a depiction of a deceased person kept in the tent. It was fed, put to bed, people made sacrifices to it asking for guidance". The Nentsy believed that after death, doppelgangers of people (souls-shadows) went to the world of the dead where they lead the same life they had in our world.

Myths of the Nentsy often have a recurring theme: a person comes into a tent with people, but nobody sees him and his speech is mistaken for the sounds of the fire. In the morning, we find that this person has spent the night in the cemetery. Soul-shadow protects people when they are alive and leaves for the world of Nga after death.

Thus, the man is a creature born by the Earth and the Heaven; often Mother Earth and Father Sky would argue who the man belongs to. In this argument, the human being is born. Being a creature of the middle world and the creation, the man takes the middle position. According to the beliefs of the Khants, the man is someone between gods and an inanimate object. "In relations between people and things the man's place is lower than that of a god but higher than that of things. Things are turned into sacrifices to the gods. <…> In the folklore in general and in myths in particular, there is no creating personality. Invention of tools, traps and fire is ascribed to different gods, spirits, but not people because people are just talking things, they themselves were created. Moreover, modern Khants say that a person possessing some talent or abilities got them from the gods" [Mythology of the Khants, 2000, p. 57]. Comparison of people to things is logical and explainable. Being a creature of the middle world, the man is just substance with a soul, i. e. he is a product of the Heaven and the Earth. It is essential for understanding the man as a microcosm. Being a microcosm, the man has to be a part of all the three worlds and have their elements in his own nature; "actual division of the triplicity is completely applicable to him: he possesses a spirit being a superformal manifestation, a soul corresponding to the area of more 'tenuous' nature and a body being in turn a material manifestation. It is the man (the 'real man', i. e. the man who has reached complete realization) is a real microcosm in the degree greater than that of any other creature in the Universe; due to his 'central position', he can be considered as an image or more likely as a 'sum' (in the sense that scholiasts used this word) of the whole set of manifestation because due to his nature described above he combines all other creatures in such a way that it is impossible to find anything not represented in the man in some degree in the manifested Universe or not having anything in common with the man" [Genon, 2004, p. 59].

If we go back to the more frequent correspondence of the man to the 'middle world', this correspondence can be called the correspondence of 'functions': the man between the Heaven and the Earth, being a part of both, plays the same part of the mediator in the Cosmos that our soul plays between the spirit and the body. This intermediate area of the 'middle world' that is generally referred to as 'the soul' or the area of 'tenuous forms' includes a certain 'mental' element which characterizes the individuality of the

man as such and is placed in the 'middle world' in the same way the man is placed in the Cosmos.

It is not difficult to understand now that the function allowing finding the correspondence of the man with the 'middle world' or with the soul is actually a function of 'mediation': the soul is often considered a 'medium' connecting the spirit and the body similarly to the role of a mediator between the Heaven and the Earth than the man himself play in the Cosmos.

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THE OPPOSITION OF THE NGANASANS RITUAL AND NON-RITUAL FOLKLORE MUSIC STYLES AS A REFLECTION OF THE IDEAS OF THE SPATIAL ORGANISATION

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The article discusses the interrelations between the musical thinking and spatial benchmarks in the culture of the Nganasans, an aboriginal people of the Arctic. Based on a study of the shamanic rituals from the music theory prospective, the author distinguishes typical signs of a musical style inherent in the ritual and non-ritual genre. The available data on the functioning of the genres and the related set of persuasions are interpreted in the light of the music theory data by identifying the correlations between the spatial benchmarks and the genres of the musical folklore (the vertical line is representing shamanic rite, while horizontal — the epic). The research has been undertaken on the basis of the field materials of 1980–2000.

Keywords: Nganasans, peoples of the Arctic, musical folklore, epic, shamanic rite, World Tree.

Introduction

A large number of scientific works that were dedicated to the study of the cultural landscapes of the world's indigenous peoples have emerged in the late 20th — early 21st century [Krupnik, Mason, Horton 2004; Buggey 2004]. Those are not just ethnological studies of the beliefs and certain rituals related to the realization of the geographical environment. The very interesting "Rivers and Peoples of Siberia" collection of articles can be an example of this [Rivers and People of Siberia: Collection of Scientific Articles RiPS, 2007]. Original studies concerning the essence of the problem are of special importance for our topic: How are human thinking processes expressed in culture as they seek to organise the surrounding world and find their place in it? Here, in the first place, one needs to take into consideration the work of a linguist K. Basso "Western Apache language and culture" [Basso, 1990], T. Ingold, cultural antropologist "The perception of the environment" [Ingold, 2000], "Metaphysics of the North" by N. Terebikhin, a culturologist [Terebikhin, 2004] and other researchers.

Reflecting basic philosophical concepts in the folklore of indigenous peoples has been the subject of a study by K. Lukin "Living space and the former island of Kolguev in everyday life, memories and narratives of the

Nenets people" [Lukin, 2011] and the one by K. Young "Taleworlds and Storyrealm. The Phenomenology of Narrative" [Young, 1987].

The established in 2014 laboratory of complex geo-cultural studies of Arctic has made the study of the ontological models of the perceiving the Arctic [the term by D. Zamyatin] as one of its tasks. The methodological position of D. Zamyatin, according to which the "mythological and ritual worlds are ready verbal texts models of perception" was very close to the author of this article. We think that ethnomusicology may also contribute to the study of these problems by examining the available music and folklore texts as a kind of "world view" of a particular people, identifying hidden codes in their cultural space.

The Researsh Materials

The Nganasans folk music — one of the small peoples of the Arctic, is a material for this article. The focus is on music and folk heritage of a famous storyteller and shaman Tubyaku Dyuhodovich Kosterkin (1921–1989, Ust-Avam village). The author had a pleasure to work both with Tubyaku Kosterkin personally (during the 1989 musical ethnographic expedition) and the collections of recorded folk music performed by him.

The Nganasans is the nation of a little more than 800 people living in the Taimyr Peninsula, which territory is located in a natural area of tundra beyond the Arctic Circle. The way of life and culture of Nganasans — the hunters on wild reindeer, are determined by the natural features of the Arctic (winter period of 9 months with blizzards and severe frosts, short hot summer, polar night and polar day, deer as a principal food source). The language of Nganasans belongs to the Samoyed group of the Uralic language family (in addition to the Nganasan, that group includes Nenets, Enets and Selkup languages). According to the research by L. Khlobystin and Y. Simchenko, the Nganasans are the heirs to the culture of ancient hunters on wild deer that came to the North of Asia from the South-East in a 5–4 millennia B. C. [Khlobystin, 1998; Simchenko, 1976]. According to ethnographers B. Dolgikh and J. Simchenko, folklorist K. Labanauskas, the shaping of Nganasan ethnic groups was affected by the Tungusses and ancient Samoyeds, who came to the Taimyr Peninsula from the South-West at the end of the first millennium B. C. [Dolgikh, 1952; Simchenko, 1982; Labanauskas, 2004]. The archaic way of live of nomadic hunters on wild reindeer, which was predicted by the extreme conditions of the Arctic, has for a long time been preserved in the culture of ancient Nganasan traditions [Grachev, 1983].

By the end of the twentieth century, the central position in the intangible culture of the Nganasans has been occupied by two musical folklore

phenomena: epics and shamanistic rituals. The crucial value of these phenomena has been associated with the specific features of the functioning of unwritten culture of those peoples. The value of the epic tales is hard to overestimate in the absence of writing putting together the sacral, mythological, historical and cultural heritage of the nation. Shamanic rituals as the centre of spiritual life and the tool of harmonization of relations between the humans and the sacred world, play an important role in a kind of philosophical and psychological functioning of the society. In relation with above-mentioned central part of those genres in the culture of Nganasans, they deserve detailed investigation.

The Musical Style of the Nganasan Shamanic Rite. Nganasan shamanism has been attracting the attention of travelers and scholars scince the 18th century. It happened that the Western (Avam) Nganasans *Ngamtusuo*, "the Generous Ones," family of shamans has became one of the most investigated branch by ethnographers (the Russian family name for them was the Kosterkins). There are publications containing rich data by the ethnographers A. Popov, G. Grachev. Y. Simchenko, J.-L. Lambert and N. Pluzhnikov about shamanistic beliefs, rituals and accessories by *Dyuhodie Ngamtusuo*, his children *Demnime*, *Tubyaku*, *Nobobtie*, and grandson *Dyulsymyaku*. The publications of texts describing the shamanic rituals of Tubyaku-Kosterkin have been issued by N. Kosterkina and E. Helimskiy, Y. Simchenko, with music of the shamanic rituals explored by O. Dobzhanskaya. There are movies and videos of shamanic rituals (L. Meri, A. Lintrop, Fedorov et al.). With the support of numerous research papers documenting the shamanic tradition of the Ngamtusuo family, the author identified typological features of musical structure of Nganasans shamanic rituals described in detail in a special paper [Dobzhanskaya, 2002]. At the same time, the characteristic elements of musical language are not only related to their functionality and semantics in the rite, but to the "feedback": namely, understanding of the fact that shamanic ritual ceremonial function determines a certain structure of the expressive means. Let us consider the sequence of complexes of musical means of expression in a shamanistic ritual.

Texture is an important feature of ritual genres. Since the rite is performed collectively (the assistant sing-along people are presented in the ritual along with the shaman), polyphony as a result of the collective performance marks the ritual genres.

The ritual is dominated by responsory singing (after each melodic line sang by the shaman it should be repeated by the helpers). The use of the responsory composition technique in shamanic rituals can be explained by several factors. Firstly, using this method the continuity of the song is achieved (which, according to the Nganasan beliefs, helps the shaman to fly and car-

ries him to the world of ghosts). Secondly, the responsory answer of the shaman assistants gives the time needed for improvisation of a new text line.

The responsory that shapes ensemble singing into a form of a solo shaman part with a refrain (answer) of the assistants repeating the line that sounded in the shaman part includes discordant chorus during the refrain. This discordant chorus (heterophony) may be perceived by ear as an unstructured sound "cloud" with spontaneous "emission" of individual voices and music segments. In general, the responsory singing technique in shamanic ritual is common among the peoples of the North and is typical for this region; it is fixed in the culture of Samoyed peoples, Evenkis and Dolgan [Dobzhanskaya, 2008a; Mazin, 1984; Steshenko-Kuftin, 1930].

Signal Intoning is an essential component of a shamanic ritual sound. Onomatopoeia with voices of zoomorphic ghosts-helpers sounding from the mouth of the shaman is evidence that those ghosts are present in the rite. The shaman masterfully imitates the voices of ghosts — animals (deer, bears) and of birds (geese, swans, loons, eagles) and in that respect the Nganasan shamanism is in the line with the general traditions of Siberian shamanism [Shatila, 1976, p. 159–160; Khomich, 1981; Mazin, 1984].

Besides onomatopoeic signals, the ones that help to control the animal herds are also presented in shamanic ritual. Shaman considers himself a shepherd the flock of ghosts as in real life a reindeer herder drives his herd of deers. The core stylistic feature of the begining Nganasan rite songs is pastoral signal — syllables *Khoi-hou-houk* are obligatory for the song of a shamanic assistant (phonographic materials of the ritual by Tubyaku-Kosterkin, 1989).

Signal intoning in a shamanistic ritual has an important ritual function, passing voice shaman's spirit helpers and thereby signaling their appearance (remember that no other manifestations of spirit helpers, except the sound does not exist).

The Types of Intonation represented in the shamanic ritual, cover the entire range of intonation features of the music folklore: vocal (connected to the singing tradition), voice, intermediate (vocal and speech-based one associated with the epics and fantastic narrative), instrumental and signal ones. In shamanism, all five types of intonation exist simultaneously, superimposed against each other: here the singing to the accompaniment of ritual instrument (tambourine, etc.) interspersed with recitative episodes and prosaic dialogue, coexists with a developed system of onomatopoeic signals representing zoomorphic helper spirits.

Musical Composition reflects the story of shamanic rite ritual embodying the journey of the shaman into supernatural worlds and his communication with the gods and it is built on the same principles as were described by

E. Novik as story units like "Start of a standoff," "Mediation" and "Elimination of shortage" [Novick 1984]. The subject completeness and symmetry of the rite structure were found by the author in the analysis of the Nganasan rites by Tubyaku Kosterkin and his relatives *[Dobzhanskaya,* 2002, p. 15–17, p. 27–28, p. 39–40].

Single story units are embodied in the major musical forms with a continuous structure. The melodic basis of musical parts are shamanic ghosts melodies, a kind of *theme songs* assigned to certain characters of the shamanic story. The melodies of shamanic spirits are the only melodic material of the rite, they are repeated many times in the parts by both assistants and the shaman, being varied and modified. The existence of own melody with each helper spirit is described T. Bulgakova in the Nanay shamanism. Apparently, this property is versatile and can be defined as a typological feature musical organisation shamanic ritual.

Large musical episodes shamanic rituals are *polimelodical:* they are based on a few tunes without interruption consecutive (such as, for example, the initial sections of the shaman rites and monologues). The sequence of tones in these episodes is dependent on the order of appearance of helper spirit, while the length of the sections is determined by the duration of the ritual situation.

The musical dramaturgy that fastens together in one shamanistic rite major musical forms (polimelodicheskie episodes), consists in the alternation of dynamic waves by means of a regular increase and decrease of emotional stress.

Metric Organisation Shamanistic Tunes. For a long time there was a point of view at the philological literature that it is not possible to talk about a cadence, poetic foot and rhyme in relation to the Samodey poetry [Hajdu, 1964]. E. Khelimskiy, following the research of the underlying forms of language developed by Ju. Janhunen, has revealed regular patterns of syllabic versification underlying archaic and new folklore [Janhunen 1986]. Many examples prove the presence of metric opposition of a 8/6-syllable line, corresponding with the opposite of sacred and secular in traditional Nenets and Nganasan versification. "Metric scheme with isosyllabic lines containing eight vocalic "moras" (syllables) each, with stressed odd syllables and caesura after the fourth "mora" is standard for the shamanic chants. This scheme oppose them not only to everyday speech with lack of metric organisation, but also to the poetry of other genres (epic, lyrical, personal and allegorical song) dominated by a six-syllable metre (six-"mora")" [Kosterkina and Helimski, 1994, p. 25]. The author of the present article analyzed the texts of shamanistic rituals by Tubyaku-Kosterkina and identified parts with different types of metrics:

1) isosyllabic 8-sylllable metric (usually a sacred text rich in ritual verbal formulas to for the shaman to communicate with the gods);
2) heterosyllabic poetic organisation (less ritualized text for the communication of the shaman with the participants present at the rite).

Usage of the 8-syllable poetic organisation in the shamanistic texts is a must not only for poetry of the Samoyed peoples. Finnish musicologist T. Leisio writes about the mandatory role of such metric model for the shamanic songs of Finnish-Baltic and Siberian peoples, and as an example brings the "Kalevala metre," which is found in the Finnish and Estonian texts associated with the mythology and shamanistic knowledge [Leisio, 2001, p. 90].

Rhythmic Organisation is a subject to the principles of *Shamanic Songs* syllabic structure (one syllable — one note). Those tunes are built on an invariant rhythmic formula reflecting the metrical scheme of verse in the four-metre trochaic line with caesura after the first two metres. It is necessary to clarify that such a strict adherence to a particular rhythmic patterns are found only in the melodies of the central episode of shamanic ritual.

The isorythmic organisation of the melodies is predetermined by the isosyllabic text in the melodies of the helper ghosts where there are no intrasyllabic chants at all. Perhaps this form of clear pronouncing of musical text is based on the magic spell function of the ceremonial section.

The main type of *Pitch Organisation* in the shamanic melodies are contrast-register melodic organisation stemming from the signal type of intonation (which is the basis of melodic intonation). The melodics in pure form, like melodics based on a juxtaposition of polarized timbre registers, is represented by the initial songs of ceremonies by Tubyaku and Demnime [Dobzhanskaya, 2002, p. 94, p. 144–148].

Timbre Organisation of the shamanic chants has specific related to the usage of marked voices: that includes voices of onomatopoeia to zoomorphic ghosts — helpers and "sound mask" of the voice of the shaman. Specific timbres, like the "growling" colouring of the voice (strong compression of the throat cavity while singing, for example, as performed by Tubyaku, brother of Demnime) and "timbre clusters" that serve to disguise the voice of the shaman and are caused by the ritual function of shamanic chants.

Ritual Function Determining the Music Style. Analysis of Nganasan shaman rite musical style showed the presence of solid features characterising the language system of ritual music (they are clearly shown in the summary table at the end of this article). It is significant that all main stylistic characteristics of shamanic singing are caused by ritual function of the music but not inherently musical. In this regard it is possible to make the conclusion,

that the musical language of shamanic ritual that was formed in close connection with the ritual practices, has a rigid ritual purpose. The semiotic figures of ceremonial musical language strictly comply with ritual functions, due to which this language is a taboo and never used outside ritual.

Now the question is What semantic role does the Nganasan shamanic ritual strict system of musical-expressive means have? Ritual music and sound system creates a special sound space (creating a kind of a "sound cloud" consisting of polyphonic singing, drum sounds, cries and onomatopoeia). This spatial extension of the music, as well as philosophical understanding of shamanic songs as "soaring up," "lifting the shaman", allows us to speak about the phenomenon of the vertical development of the spiritual reality embodied in music. Indeed, the musical language is submitted to this phenomenon: its means are intended to imitate, to show the flight of a shaman (the constant increasing of the tone while singing is the most striking evidence of a gradual ascent in the space). Thus, a special effect is achieved by means of music: the melody of the song thickens being reinforced by many voices, rises in pitch and … carries the shaman into the different reality. We can make the conclusion that the shamanic music has a spiritual power and can connect the supernatural and real world. It can be understood as an audio analogue of the World Tree. The philosophical concept of the World Tree as vertical axis connecting the Earth (Middle World) with Upper and Lower Worlds — is the main informative message that is encoded in the sound of the shamanic rite. Let's now consider the music and the plot specifics of epic genres and try to identify the philosophical concept encrypted in the sound epics.

Nganasan Epics

Epic narrative includes two forms marked by national names: *sitaby,* a "fairy tale" and *dyurymy,* "true story, a story." This opposition of the national terms reflects the specific content of the sitaby (epic tales, appealing to the sacred past of ethnic group) and dyurymy (historical and mythological legends, the events, which are within the framework of the historical memory of the people). Two types of intonation in Nganasan folklore separate those genres. Moreover, the composition of sitaby is determined by alternation of narrative (prose) and song (poetry) episodes: "The texts of the sitaby have a mixed form of song and prose (singing mixing with the speech), while dyurymy is only a narrative … According to a figurative expression of the performers: dyurymy *hÿotə myəδity* — "always go on foot," while sitaby, sometimes, *insyuzÿtÿ* — "driven by a team." So, the transition to the melodic part is associated with a ride on reindeer" [Kosterkina, 2002, p. 499]. This

statement reveals immanent connection between movement and sound — the crucial for Nganasan thinking [Dobzhanskaya, 2008a, p. 88-89].

Musical Style of the Epic Genres. Tales are performed in solo unaccompanied by any instrument. A figurative definition to the specific way of performing the epic was given in 1986 by an outstanding Nganasan narrator Tubyaku-Kosterkin, while working with the researchers and musicologists — "Every sitaby goes its own way" (is sung to its own melody). That means that the legend is attached by a special melody that serves as melodic "marker" of the plot and is persistently retained in the transfering by different performers. Epic tales are single-tuned and the catalogue of epic stories composes the musical encyclopedia of epic melodies [Dobzhanskaya and Grigorovskiy, 1994, p. 50]. The melodics of the sitaby is recitative, while rhythmic organisation of the melodies reflects the syllabic structure of the text. The sitaby are intoned in a vocal and speech manner, flexibly combining singing and speech (vocal melody or recitative becomes purely verbal recitation of the text, and vice versa). The *sitaby* and *dyurymy* are extensive narrative where the story of the plot usually continued for several nights in a row. It was necessary to narrator to have a great memory of the epics, extraordinary acting ability, to be emotional, with an expressive facial mimics and gestures. The *sitaby* is usually accompanied by the pantomime of the narrator, depicting the characters' actions. Interested participants vividly responded to the events of the story. There was someone to ask questions in the audience, interrupting the narrator with comments. This person expressed his surprise to what is happening. Without such partner the tale, representing a kind of dialogue with the audience, could not have taken place [Ojamaa, 1989, p. 123]. A special feature of the epic story-telling is the presence of the assistant, *tuoptusi* (or *tuoptugusi),* emotionally reacting to the content of the story. The name and function make the role of tuoptugusi similar in shamanistic rites and sitaby, which is noted by G. Grachev: "… it is desirable the listeners (of the epic tales — *OD)* constantly say ditto, respond vocally to the sharp plot points, etc., as if they did … in short form what the shaman's tuoptugusi does" [Grachev, 1984, p. 92].

As an example, let us consider the text of the "Seu Melyangana" epic tale by Tubyaku-Kosterkin. The recording of the "Seu Melyangana" legend has been carried out by his daughter the folklorist Nadezhda Tubyakovna Kosterkina (1958–2006). The text of the tale was glossed and published by V. Gusev [Gusev, 2005] along with the other texts of Nganasan[1].

[1] Gusev V. 2005. Seu Melyangana: The Body of the Nganasan Folklore Texts. URL: https://www.iling-ran.ru/gusev/Nganasan/texts/index.php. (In Russian)

"Seu Melyangana" Sitaby

The "*Seu Melyangana*" (Blinking Eye) sitaby (another name for this epic story is "*Syunazy Naniku*" "The youngest of the Syunazye family") is one of the favorite epic stories of Tubyaku-Kosterkin. Linguists say that the plot is borrowed from the legend of the Nenets people. It tells about the heroic courtship Syunazy Naniku (essentially, that matchmaking is kidnapping the bride) and heroic warrior battles between clans of Syunazy and Nguirye. N. Kosterkina attributes this epic story to the class of heroic sitaby in which "… are the main themes of heroic courtship (obtaining a wife), the characters trying strength against one another and blood vengeance." [Kosterkina, 2002, p. 504].

The plot of the tale is devoted to the theme of the heroic matchmaking and a scrum between different families. Let us briefly retell the plot of the legend. The hero Syunazy Naniku is characterized as a warrior of enormous strength and power. "His two shoulders are like thick logs". "His two muscles go straight from two broad shoulders thick as the neck of a seven-year-deer". He's acting boldly and defiantly abducting the girl named Ngabtyu Basa Ny from the Nguirye family — "a woman with a metal ornaments in her hair" which "radiates her beauty on earth for the entire length of argish stretch." Brothers of the kidnapped girl — Seu Melyangana (son of Nguirye), Ngiede Bazatuo (son of Dyusirie) and Iniaku Samu "Granny Hat" (son of Huaa Chenda) obey Syunazy Naniku and agree to be his workers — the shepherds in his herd. While working as shepherds, they suffer famine and deprivation, however, still fulfill all the orders of the master. In the end, having served all the allotted time, they get wives of the Syunazye family and reindeer sleds as a reward, and return back home. In addition, Seoul Melyangana, instead of his broken weapon gets from his older brother named Syunazye Dengini Sunda a twisted bow, a precious ancestral weapon.

Due to the large volume (1537 lines) and elaborated plot, the "Seu Melyangana" legend is an encyclopedia of Nganasan epic heroes' images. The author in a special article [Dobzhanskaya, 2008b, p. 48–50] has described imaginative means in characteristics of heroes, used in the story.

The epic chant of "Seu Melyangana" displays it belonging to the Nenets tunes. First of all, attention should be paid to a wide octave range of the melody and multy-step scale drawn on the first row of the music period in the key of the original sample (it should be noted that a wide range and lyricism are not specific for Nganasan epic melodies; those musical language means indicate its origin from the Nenets Tunes). Second, the structure of the melody is based on stable melodic and rhythmic formulas that are not exhausted by local initial and final sing-alongs, marking the beginning and

end of the song line. Third, the specific strophic form of the tune (AB) with contrasting the tonal centres spaced with a minor third gives the feeling of a certain tonal melodic organisation.

The value of the sitaby epic genre for illiterate peoples of the polar tundra is hard to overestimate. The author agrees with the opinion of Nadezhda Tubyakovna Kosterkina who considered sitaby as a centre of culture and a kind of encyclopedia of historical and geographical knowledge, public relations, ethical and aesthetic guidelines for Nganasans.

It is important to emphasize the following: the longterm unfolding of the epic plot, detailed disclosure of images of the main characters and dramatic turmoil of the struggle between heroes are expressed in sitaby music by fairly one-dimensional musical expression: we see an endless repetition and variation of the same monophonic melody of the storyteller. You can draw an analogy with treeless tundra landscape, which is monotonous for an ignorant person. However, this landscape is filled with information and sufficient for the hunter or herder. Likewise, the Nganasan epic plot sparingly embodied in musical tools is interesting and perfect for the inhabitants of the tundra.

The horizontal world of the Nganasan sitaby unfolding over time musically and stylistically embodied by a monophonic vocal melody unaccompanied by an instrument can be compared with the linear Nganasan ornaments (the most common type of ornamentation on clothing), in which the figure countless times repeats the same motif. Such horizontal line of the epic tune similar to the linear ornamentation is quite clearly expressed by musical means: a leisurely melodic unfolding in a natural storyteller voice register, repeating sing-alongs and speech insertions explaining individual scenes of the tale. Devoid of sharp differences and contrast development, the melody line is consistent with the horizontally oriented plane of tundra, a place where the epic heroes of the Middle World live. Apparently, the philosophical concept of the epic storytelling identified by us with the help of the musical and expressive means — orientation on the horizontal plane of the earth — is associated with the specifics of the ethnic interpretation of history and mythology.

Findings

In conclusion of the article we would like to demonstrate the opposition of the musical language and structure of musical means of expression in a shamanistic ritual and epic genres of the Nganasan, as a manifestation of different mechanisms of the cognition of the reality.

Table 1. **Nganasans ritual and non-ritual music style**

Ritual music style	Non-ritual music style
Combination of 5 intoning types: vocal, speech, vocal and speech, instrumental (playing tambourine) and signal (sound imitation)	Alteration of 3 intoning types connected with the singing, speech and melodic pronunciation of the text: vocal, speech-based and vocal-speech based
Responsory type ensemble signing accompanied by a an instrument (tambourine or instruments replacing it)	One-part solo singing without an instrumental accompaniment
Musical composition is a large polymelodic formation (in which the melodies are sound embodiments of shamanic spirits)	Musical composition represents a variation of one single tune (music marker of the epic text)
Gradual increase of the tune's tone connected with the rising emotional tone of the shaman while conducting the ritual is a rule of sound-pitch organisation	No rising of the pitch
Eight-syllable verse	Six-syllable verse
Invariant rhythmic formula lying at the basis of all the melodies of the central part of the shamanic rite and reflecting the metrics of the poetic line	Rythmics reflecting the syllabic structure of the text
Timbre specifics of the shamanic songs creates an image of a "ritual mask" which likes the singing shaman to the totem animal or the shamanic helper spirit	No timbre individualization, usage of registers natural for the story-teller's timbre
Idea of the shaman's flight (vertical line)	**Idea of the tundra travel (horizontal line)**

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A LARGE-SCALE SYSTEM OF INTERACTION IN RUSSIAN ARCTIC ISSUES: EDUCATIONAL PROGRAMME PROSPECTS

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This paper is devoted to the possibilities of large-scale reorganisation of the Arctic knowledge and system of development institutions. The decision of the Government of the Russian Federation has made it possible to create today a unified management mechanism based on the Russian Far East and Arctic Development Corporation focused on achieving national goals. Today, Russian and foreign investors, who are implementing projects in the Far East and the Arctic, have a "single window" that provides comprehensive business support in conditions of preferential regimes, the use of tax incentives and administrative preferences, services and services.

Keywords: Russian Arctic, large-scale reorganisations, University of the Arctic, Russian-Chinese case-study.

Introduction

A large-scale reorganisation of the system of development institutions, carried out by the decision of the Government of the Russian Federation, has made it possible to create today a unified management mechanism based on the Russian Far East and Arctic Development Corporation focused on achieving national goals. Today, Russian and foreign investors implementing projects in the Far East and the Arctic have a "single window" that provides comprehensive business support in conditions of preferential regimes, the use of tax incentives and administrative preferences, services and services.

Russian-Chinese Case-Study

The ongoing Russian-Chinese meetings on the development of the Arctic traditionally form the topical areas of cooperation between our countries in the development of the polar region. Much attention is paid to international cooperation in the Arctic in the plans for Russia's chairmanship of the Arctic Council in 2021–2023. At the same time, the international agenda also includes the educational sphere. Too much in common unites us with the Nordic countries and in this regard, it seems, the educational

programmes should contain common competencies based on universal values in the Arctic. The participation of other countries in the socio-economic development of the Arctic translates into joint educational programmes. First, these are the investing countries. Among them, the People's Republic of China stands out, which has achieved impressive success in the socio-economic, scientific-technical and other spheres[1]. Russian-Chinese cooperation in various areas fully meets the interests of our peoples and "goes along with the strengthening of security and stability at the regional and global levels"[2].

Over the years of Russian-Chinese cooperation, a large number of mutually beneficial projects have been implemented, and the scale of cooperation is growing every year. In August 2021, the Russian Far East and Arctic Development Corporation (Ministry for the Development of the Russian Far East) held a round table on the topic of promising areas of cooperation between Russia and China in the petrochemical industry[3]. Representatives of Russian companies — initiators of projects for the development of natural gas fields, the creation of a gas chemical complex for the production of methanol and the creation of a hydrogen cluster — discussed the prospects for cooperation with potential investors — the largest oil and gas and energy companies in China. Nine oil and gas and energy companies with total revenue of over $ 850.5 billion attended the meeting on the Chinese side. China National Petroleum Corp — the third largest oil company in the world, Sinopec — one of the largest oil and gas companies in the PRC, and others were among them. Today, the Far Eastern Federal District, one of the main sources of Chinese energy imports, accounts for more than 70 % of Chinese investments, and 58 Chinese companies are residents of the Advanced Special Economic Zone (ASEZ) and Free Port of Vladivostok (FPV).

Such coutries as the United States and Canada, Denmark, Finland, Iceland, Norway, Sweden are actively cooperating in the European part in the Arctic. They interact within the framework of cooperation between the Nordic Council of Ministers and the Nordic Council. These associations are aimed at sustainable development in the field of marine biotechnology, renewable energy, development of the Arctic shelf, shipping, tourism, which

[1] China is investing in the Yamal LNG project and is showing great interest in the development of the Northern Sea Route

[2] Putin Vladimir, congratulatory telegram to the PRC on October 1, 2021, on the Day of the PRC in 1949.

[3] Chernov I., Director of the Investment Development Department of the Ministry of the Russian Federation for the Development of the Far East and the Arctic. Address to the Constitutional Court on August 16, 2021.

allows them to integrate into world economic processes. Such cooperation allows them to carry out their plans with a synergistic effect.

It is known that the People's Republic of China, as the closest neighbor of the Far Eastern macro-region, is also the largest trade and economic partner of Russia with a turnover of 104 billion US dollars per year. Cooperation between the two countries in the petrochemical industry has a long and dynamic character[4]. The possibilities of our cooperation are far from being exhausted by the energy sphere. We are ready to expand cooperation with our Chinese colleagues, who can become our full-fledged partners in the field of education, including in training personnel for the Arctic.

The topic of personnel training is one of the main conditions for the effective development of the polar region at the Strategy for Developing the Russian Arctic Zone until 2035. According to the Ministry of Science and Higher Education of the Russian Federation, in 2019 the need for personnel for the Arctic counted 25 thousand people. The greatest demand is for miners and oilmen, specialists in shipbuilding, water transport, etc. Following the engineering specialties, there will be a need for humanities. In this regard the issue of training a new wave of qualified management personnel and specialists has arised.

In 2017, the Arctic countries signed an Agreement to strengthen international Arctic scientific cooperation. The signing of the Agreement is justified, first, by the need to simplify the access of scientists to data and the national infrastructure of the Arctic for research, as well as the need to intensify cooperation between scientists at the international level, exchange the best practices of special education on responsible management. Within the framework of the Agreement, the countries that signed this document committed themselves to make every effort to simplify the process of conducting research by scientists from all over the world.

The effectiveness of the implementation of the Agreement was analyzed in a study conducted by the University of the Arctic jointly with the International Arctic Science Committee and the International Arctic Social Science Association in spring 2019. In the course of the study, 136 respondents engaged in scientific activities in the Arctic were interviewed, during which the main problems were identified, as well as the successful experience achieved after the signing of the Agreement.

According to the survey results, only 8% of respondents stated that there are specific problems in conducting international scientific research, such as lack of access to some scientific sites and databases, the presence of

[4] Nabatchikova A., Managing Director for Petroleum Chemistry, Corporation for the Development of the Far East and the Arctic. August 16, 2021, COP.

bureaucratic problems, often-difficult access to meetings, conferences, etc. Despite this, the absolute overwhelming majority of respondents noted the extremely positive experience of conducting international scientific work in the Arctic, namely, the possibility of free movement, close cooperation with local scientific communities, access to all resources that allow for a full-fledged research. During the existence of the Agreement, whole cooperatives have been formed, in which the regions interact very closely with each other in the process of carrying out scientific activities. Such a successful experience of interaction to date is supported by the desire of researchers from all countries to expand cooperation and attract stakeholders for research in the Arctic from all over the world.

In addition to the Arctic Council, many other international organisations are involved in the development of the Polar Region, such as the Barents Euro-Arctic Council, the Northern Forum, the University of the Arctic and other organisations. Each of them carries out a wide range of actions and implements many projects aimed at solving pressing Arctic problems.

In the field of education development, the University of the Arctic plays a key role, which is an international network of universities, colleges and other organisations working in the field of research and higher education in the Arctic region. In the area of research development, UArctic has the following goals:

- expansion of international scientific cooperation between universities and research centres;
- improving opportunities and conditions for funding research and development activities;
- promoting cooperation with international scientific organisations.

To achieve these goals, the University is implementing many projects, primarily by creating conditions for close interaction of research centres, organisations, researchers from all over the world, students and all stakeholders in the development of the Arctic. An important component of the University's activities are thematic networks, which are interdisciplinary associations of scientists from all over the world. Thematic networks provide opportunities for their members to conduct joint scientific research using the best practices of each of the parties, which helps to create a natural basis for the development of international scientific cooperation in the North. Today, there are 47 such thematic networks, examples of which are: Arctic Law, Arctic Security, Arctic Geology, Permafrost, Arctic Engineering, Arctic Health and Wellbeing, Arctic Research Promotion and others.

The University of the Arctic works closely with universities located within the Arctic region. Training highly qualified personnel capable of us-

ing effective tools for the development of the North in the future is a key task facing Arctic universities. Today, foreign and Russian Arctic universities offer students a choice of an extensive list of educational programmes aimed at obtaining both general specialties and more narrowly specialized ones. Such narrow-profile specializations are aimed at training personnel who are ready to work in the future at enterprises specializing in the development of the northern territories. However, the list of such educational programmes offered by foreign and Russian universities is quite heterogeneous (Table 1).

Table 1. **Some educational programmes for training specialists for the Arctic in foreign and Russian universities**

Educational Institution	Programme	Qualifications	Length of Study	Characteristics
University of Saskatchewan (Canada)	Saskatchewan Urban Native Teacher Education Programme	Bachelor's degree	4 years	https://www.usask.ca/
	Northern Governance and Development	Master	16 months	Includes discipline Public administration in the North;
Lapin Yliopisto University of Lapland (Finland)	Master's Degree Programme in Northern Tourism	Master's	2 years	The programme offers an education based on the research activities of leading scientists in the field of tourism in the Arctic.
University of Alaska Fairbanks (USA)	Arctic and Northern Studies	Bachelor's degree	4 years	interdisciplinary study of the protection of the rights of indigenous peoples, environmental problems, etc.
	BLUE MBA: Business Solutions for a Changing Arctic	Master	2 years	Graduate students have the skills to develop business models to ensure the sustainable use of Arctic bioresources.
	Natural Resources and Sustainability	PhD	-	The programme prepares specialists and academic researchers with the skills to manage natural resources and the environment in the Arctic.

Educational Institution	Programme	Qualifications	Length of Study	Characteristics
The Arctic University of Norway (Norway)	Governance and Entrepreneurship in Northern and Indigenous Areas	4 Years	Master	The Master's programme teaches students the governance skills that contribute to improving the lives of northern peoples.
	Northern Studies	Bachelor	3 years	https://en.uit.no/startsida
University of Iceland (Iceland)	Nordic Studies	Master	3 years	The programme encourages students to conduct research in the development of the culture of the North https://english.hi.is/
Technical University of Denmark (Denmark)	Cold Climate Engineering	Master	2 years	Students receive firsthand information about working as an engineer in Greenland or Svalbard
Lomonosov Northern (Arctic) Federal University (Russia, Arkhangelsk, NArFU)	Living systems of the Arctic and Subarctic	Bachelor's degree	4 years	The programme prepares highly qualified personnel capable of conducting research on the study of the functioning conditions of biological objects in the Arctic and Subarctic
	Construction in a cold climate	Master	2 years	The programme prepares highly qualified specialists who are able to design and organise the construction of buildings in a harsh climate in the North.
Yakutsk State Agricultural Academy (Russia, Yakutsk)	Traditional branches of the North	Bachelor's degree	4 years	The programme prepares specialists capable of applying modern technologies in breeding farm animals and preparing feed and feed additives.

Educational Institution	Programme	Qualifications	Length of Study	Characteristics
The Ammosov North-Eastern Federal University (Russia, Yakutsk, NEFU)	Sustainable development of the Arctic (joint programme with Hokkaido University, Japan)	Master	2 years	Training of highly qualified personnel in the field of applied, pedagogical and project activities in the field of geoecology.
Russian Academy of National Economy and Public Administration (Russia, RANEPA-RANEPA Moscow)	Management of the development of the Russian North	Master	2.5 years	The programme is aimed at those who are professionally engaged in responsible management of the socio-economic development of the Arctic.

Source: official Universities web[5].

Several programmes among foreign educational programmes contain management disciplines (public administration, management, etc.), as it follows from the table. But in general, they are focused on ecology, natural resources, indigenous peoples and do not represent a holistic view of the responsible management of the socio-economic development of the Arctic.

The specified list of the programmes, of course, is not exhaustive, but it demonstrates the main fields offered to the students by Arctic universities. Educational institutions provide an opportunity for students to master the skills of managing the development of the North both within the framework of the bachelor's degree and within the framework of the master's and postgraduate studies. Moreover, many programmes are carried out jointly by several universities, which indicates the development of scientific and edu-

[5] University of Saskatchewan (Canada). URL: https://www.usask.ca/; Lapin Yliopisto University of Lapland (Finland). https://www.ulapland.fi/EN; University of Alaska Fairbanks (USA). https://www.uaf.edu/uaf; The Arctic University of Norway (Norway). https://en.uit.no/startsida; University of Iceland (Iceland). https://english.hi.is; Technical University of Denmark (Denmark). https://www.dtu.dk; Northern (Arctic) Federal University named after M. V. Lomonosov (Russia, Arkhangelsk, NArFU). https://narfu.ru; Yakutsk State Agricultural Academy (Russia, Yakutsk). http://ysaa.ru; North-Eastern Federal University named after M. K. Ammosova (Russia, Yakutsk, NEFU). https://www.s-vfu.ru; Russian Academy of National Economy and Public Administration (Russia, RANEPA, Moscow). https://www.igsu.ranepa.ru/.

cational cooperation and partnership between the Arctic and non-Arctic countries.

Several differences can be distinguished along with the similarities upon a detailed examination of the specified list of educational programmes. The main ones are in the intricacies of the specialisation of certain programmes. Some of them are more general and are collectively called Northern Studies (represented at the University of Alaska Fairbanks, University of Tromsø, etc.). Such programmes are provided for students to choose from, mainly within the framework of a bachelor's degree and allow students to study the culture, geography of the Arctic, the main directions of politics and economic development of the northern territories.

However, most programmes, including master's cook, are more narrow specialists. One promising area is the training in the field of environmental control and environmental management in the territory of the Arctic. In this generalized category can also include programmes that specialise in matters of climate change, the North and the conservation of biological resources and the unique ecosystem of the Arctic. These programmes are presented in the following universities:

- University of Alaska Fairbanks, USA (Natural Resources and Sustainability, PhD);
- University of Aarhus, Denmark (Environmental Governance in the Arctic …, Masters, PhD);
- University of Stockholm, Sweden (Polar Landscapes and Quaternary Climate, MA);
- Italian Society for International Organisations, Italy (Sustainable Development, Geopolitics of Resources and Arctic Studies, MA);
- NArFU (Natural resource potential of the Arctic, Bachelor's degree);
- NEFU (Sustainable development of the Arctic, together with Hokkaido University, Japan);
- Magoo (Environmental Management in the Arctic, bachelor).

The relevance and importance of these educational programmes is due to the need to find a balance in the development of economic activity in the Arctic and the preservation of its unique ecosystem. In addition to the above areas, other considered educational programmes are more highly specialized and aimed at training specialists in the following areas:

- development of tourism in the Arctic (University of Lapland, Finland),
- development of Scandinavian culture (Icelandic University);

- engineering and construction in a harsh climate (Technical University of Denmark, NArFU (Russia));
- development of animal husbandry in the Arctic (State Agricultural Academy (Yakutsk, Russia));
- issues of law in the field of protection of the rights of indigenous peoples (University of Akureyri (Iceland), University of Saskatchewan (Canada));
- development of deposits in the Arctic shelf and oil and gas business (NArFU (Russia)), etc.

Conclusion

As shown by the analysis, only three universities are involved in the preparation of management personnel for the Arctic — the University of Tromsø (Norway), the University of Saskatchewan (Canada) and RANEPA (Moscow, Russia). Even 10–12 years ago, neither Norway nor Canada was involved in the training of management personnel for the Arctic, but they always showed interest in the master's programme of the IGSU RANEPA "State and Municipal Management of the Social Development of the Russian North".

This programme was developed in 2001 and until recently was the only one not only in Russia, but in all the Arctic countries. Upgraded Master Management Training Programme for the Arctic "Management of the Russian North (IRDA)" takes into account the diversity of the potential of the Arctic regions and municipalities. It focuses on personal development, acquisition of useful communication skills, expression and development of the best qualities of students, their abilities and aspirations. Study leave them thrills, adds to their knowledge on the management of the Arctic territories in the Nordic countries.

Today we are negotiating with the French scientists on a joint programme for managers. It seems appropriate to consider cooperation with Ocean University of China (Qingdao, China). As you know, the future global problems facing humanity can become a problem of clean water on the globe. It is known that there are large reserves of it in the Arctic. Responsible management of the Arctic will provide the necessary fresh water reserves for future generations, and to put reaching socio-economic processes on a platform of sustainable development. From the inclusion of the oldest Ocean University of China (Qingdao, China) with the specificity of water issues in the training of managerial staff for the quality of the Arctic, in our opinion, will benefit.

It seems that it is advisable to create a Russian-Chinese educational Arctic Centre at the first stage of cooperation, within the framework of which to start developing a joint programme, funded on an ongoing basis. Long-term good-neighborly relations between our countries and scientific cooperation of St Petersburg University, AARI, IGSU RANEPA, the Ocean University of China (Qingdao, China) will allow us to develop high-quality training programmes for specialists for the Arctic, taking into account impending water problems, to develop the necessary competencies for all those working in the circumpolar space.

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IMPLEMENTATION OF "TRANSLATION FOR EXPERT COMMUNITIES" MINOR EDUCATIONAL PROGRAMME IN DIAMOND PROVINCE OF RUSSIA, THE REPUBLIC OF SAKHA (YAKUTIA)

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A minor educational programme "Translation for expert communities" in Mirny Polytechnic Institute started in 2013 within the English Language and literature department. The content of the programme is unique and based on the student's book "English for Diamond Miners", and the Mirny Polytechnic institute is the copyright holder. The course uses the method of Content and Language Integrated Learning (CLIL) and incorporates the following four components indicated by David Marsh: Content, Communication, Cognition and Culture. The content of the course is tailored to cover all the stages of diamond prospecting, exploration, mining, processing, manufacturing and finally, sales in English and is aimed at creating cognitive matrix of the professional field of diamond miners. The communication aspect of the programme is realized through the real life situation method to stimulate both cognitive and communicative processes and to help the students master the competence of language mediation. To integrate the cognition component, the mind mapping method is used. The objective of the latter is to develop creative and analytical thinking. Culture component is included with the help of media and online open sources to acquaint the students with authentic and up-to-date material to be aware of the current situation of the professional field. The completion of the programme allows the graduates to increase their value on the competitive job market, so while the potential employer is not interested in training, the students are primarily keen on acquiring foreign language communication skills. The article also deals with the challenges that are faced during the organisation of the translator students' job training. Despite of it, there is high level of programme enrollment: graduated ratio testifies to the success of the programme.

Keywords: translation, expert communities, minor programme, English language, diamond mining.

Introduction

In modern educational space, it is generally accepted that a graduate of a higher education institution should have a foreign language communicative competence. Many higher education institutions have included minor

educational programme "Translation for expert communities" in their portfolio of programmes and our institute is not an exception.

When in 1994 a branch of the Yakut State University was founded in the town of Mirny — the famous diamond province of Russia — our goal was to train skilled specialists for diamond mining industry, as well as forward-thinking professionals with good command of the English language, up to the latest world standards.

The idea to start a minor educational programme "Translation for expert communities" came to the institute's management immediately, but there was no proper methodological basis at the time. In 2012, under the supervision of the then director of the Institute Albina Goldman a curriculum was developed and text book "English for Diamond Miners" was written. The authors represented English department of the Mirny Polytechnic Institute and Translation department of Alrosa PJSC (public company), Russia's leading diamond miner. In 2013, the Institute obtained the license for training students on this programme and enrolled first students from the English department offering them the opportunity to receive additional qualification of a translator for expert communities. Two years later students from other departments and Alrosa employees joined the programme. These mixed groups proved to be of great benefit and students from humanities could address specialists of the field to understand the peculiarities of diamond mining in order to be able to translate professional communication properly.

*Curriculum.*The content of the programme is unique and the Mirny Polytechnic institute is the copyright holder.

The two-year programme covers 1510 academic hours and includes the subjects connected with translation practice and theory, cross-cultural communication and language theory.

The course includes twenty-six units, covering all the stages of diamond mining, manufacturing and sales. Students learn not only specific terminology but also fundamentals of diamond industry.

Contents of the programme. The implementation of the minor educational programme at the Mirny Polytechnic institute can be regarded as one of the ways of realization of Content and Language Integrated Learning (CLIL). The CLIL technology is widely known in the sphere of education and now is being adopted by many Russian universities [Yakaeva et al., 2017; Akimova et al., 2020]. The approach was first suggested by David Marsh and meant that language should be learned in integration with other subjects at school [Marsh, 2010]. The structure of our course was designed according to the 4 "C" of David Marsh's approach.

The content of the course is tailored to cover all the stages of diamond mining, processing of diamonds, diamond manufacturing and trade in English. In order to be able to translate highly specific technical field the translator should know at least the basics of it. The emphasis is put on the content of the educational material; the most important thing is the understanding of professional field specifics, not mere memorizing of the words. Scholars note that the application of CLIL can be very helpful in acquisition of terminology [Akimova et al., 2020]. Our goal is to acquaint students with the history of the diamond mining industry, the fundamentals of mining, ore processing, diamond manufacture and marketing. Some units are devoted to the world diamond mining and trade, the manufacture of lab-grown diamonds, as well as issues of social and environmental responsibility of mining companies. The final units are dedicated to business communication in the diamond mining industry, including participation in industry events and employment issues. 26 units make up a single system, i. e. a cognitive matrix [Goldman et al., 2018], the acquisition of which allows a would-be translator to become well-informed in this sphere.

Communication. This component implies ability to realize professional communication, to conduct a dialogue and exchange experience with foreign specialists. To develop this component, during the first year of translation study we organise project-type practical on-site classes. Students prepare projects in mini-groups, acting as guides and translators in museums, sights of Mirny and Alrosa's sites of public access, such as culture and sports facilities. These mixed type mini-groups include students of the Philology department with good level of English and mining students and specialists who know the field well. Their cooperation makes the work more effective. During the work on the project students practice consecutive interpretation, learn to work with difficult specific terms and develop translation skills. Scholars of the Kemerovo State University also have an opinion that mixed groups are of greater effect: "Grouping mining and philology bachelors allows for a perfect teaching environment in which both groups benefit from experience sharing" [Marinova, 2018].

For example, they practice their translation and public speaking skills at Alrosa history and production museum and prepare a guided tour of the place acting as a guide and a translator.

The first part of permanent exhibition of the museum tells the visitors about the very early history of diamond mining, from the ancient times and to the present days. In order to translate this part a student should study specific vocabulary linked to astronomy, geology, history and diamond mining, and be able to present the information in an interesting and informative way. This work requires thorough preparation with the group-mates.

Students decide on the parts they will elaborate and the roles they will play. The method of team work helps the students to interact with each other and develop communication skills in a broader sense.

The second part of the permanent exhibition of the museum tells about Yakutia, its flora and fauna. There is a reconstruction of geologists' tent camp, and personal belongings of geologists Larissa Popugaeva, Natalia Kind, Yury Khabardin, and others. This part of the museum is devoted to the pioneers of diamond mining in Siberia, and to organising prospecting and exploration and mining activities in unexplored region in conditions of permafrost.To translate this part the team should deal with geographical terms, familiarize with geological prospecting, exploration and specific diamond mining vocabulary.

The exhibition further tells the visitors about the history of Alrosa, and people who contributed greatly to the development of diamond mining in Russia. This part contains models of the Mir kimberlite deposit and Aikhal open pit mine, followed by a hands-on exhibition of mining equipment and geoscience methods used for diamond prospecting and exploration. Another clickable screen is dedicated to the cutting and polishing of diamonds. The task for the team is to role-play real life situation of consecutive interpretation. The preparation involves theoretical study of mining methods, mining equipment, mineral processing etc.

The authors are convinced that such practical training in industry-themed museum is a good opportunity to get a general idea of the field of translation for expert communities. This part of our programme is an integrated task, used to help the students to master the competence of language mediation as stated in updated Common European Framework of Reference, CEFR.

Scholars in the field of translation theory highlight the effectiveness of real situation method for stimulating cognitive processes, including creative thinking [Verbitskaya et al., 2009]. We are convinced that the possibility to provide real life situation at the Alrosa sites throughout the training process is the strongest point of our programme.

Cognition. This component is connected with the language acquisition according to human cognitive mechanism. Visualization helps a lot for cognition of intricate technical material connected with diamond mining. As part of the cognitive approach, we use the method of cognitive schemes that stimulate analytical thinking and deeper perception of the theme. Here is an example of a cognitive diagram on the types of mining (Fig. 1).

Using of visual aids allows students to see the core of the topic and differentiate between types of mining. As the diagrams are explanatory and generalized, they are especially helpful for Philology students. The cognitive

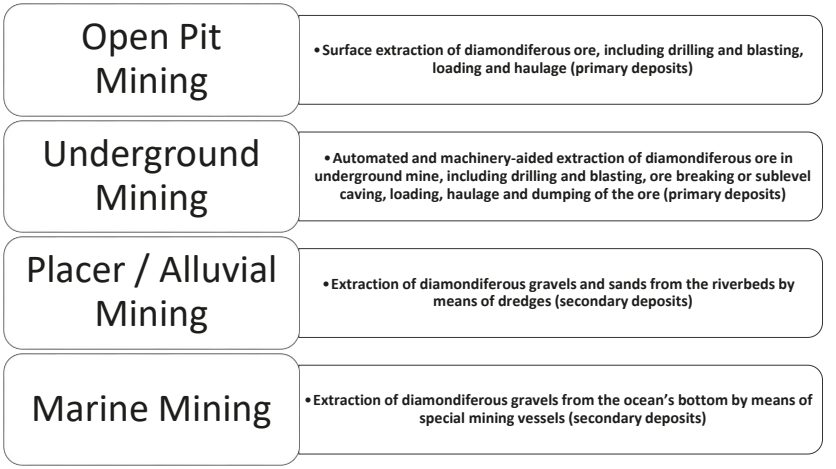

Fig. 1. Types of diamond mining

approach views learning as a conscious thinking process involving the reasonable use of learning strategies [Goldman et al., 2019].

Our recent study also showed that one of the effective ways of applying cognitive approach and visualization was the method of mind mapping [Ivanov et al., 2018]. A mind map is a graphical expression of the associative (radiant) thinking process. The starting point is the central image, and rays diverge in all directions from it [Buzan, 2018]. The mind map "Mining Equipment" (Fig. 2) describes mining machines and equipment used in certain types of mining operations: opencast mining of primary and alluvial deposits, underground and marine mining of diamonds.

This map not only helps the student to memorize vocabulary, but also stimulates analytical and imaginative thinking, develops speaking skills; helps to understand the specifics of the use of high-tech equipment in the professional field. The teacher can use a mind map as an illustrative material when explaining a new topic or organising team or pair work. In general, mind maps show connections between phenomena, the logic of events, combine a large amount of data, build a hierarchy of thoughts, and thus serve to assimilate and systematize knowledge.

Mind maps in teaching translation can be equally used both to present new information when students get the first idea about the topic, to teach new vocabulary in the context of the topic, and also assimilate the acquired knowledge by creating and strengthening associative series.

The combination of teaching strategies: real situation method, project method, cognitive method — is effective for development of communicative and professional competencies of the students.

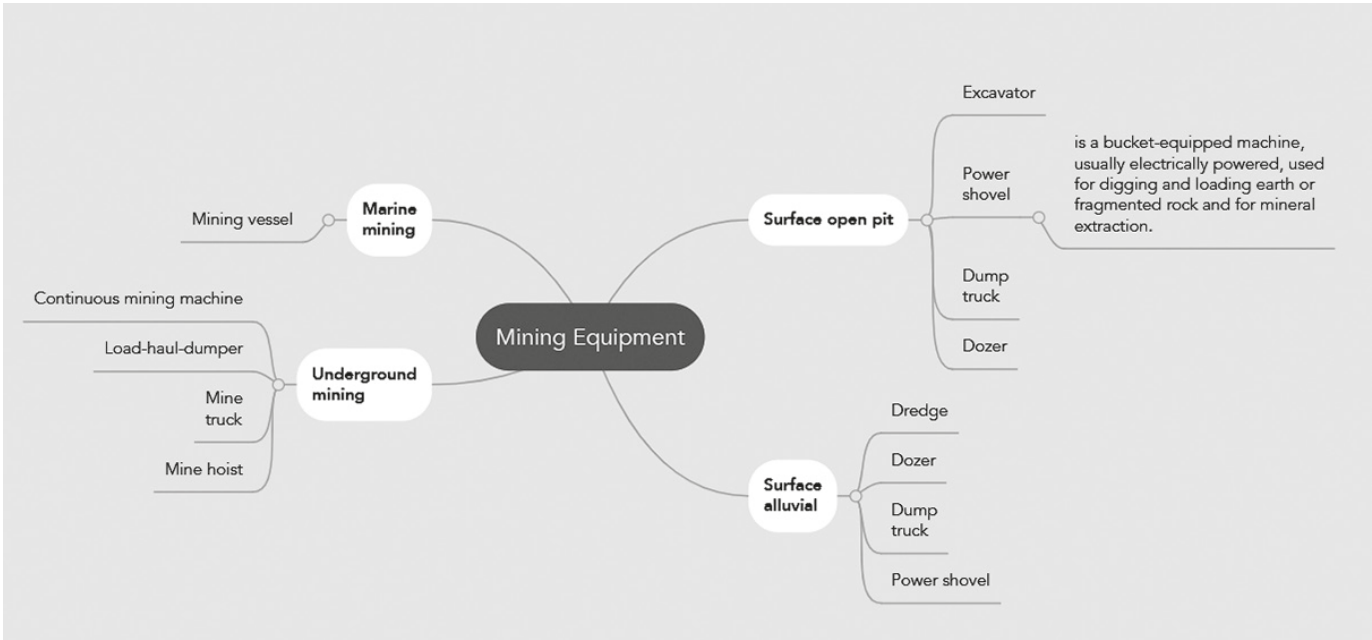

Fig. 2. Mind Map "Mining Equipment"

Culture. It is important to form the skills of successful intercultural communication, which is achieved primarily through the study of the realities of language culture in a given professional area, and can be done, for example, with the help of media. For this, the relevant language material is carefully selected from newspapers, websites, as well as multimedia hosting services, scientific and industry technical papers.

Video is sourced on-line from open sources (streaming services or mining companies news releases) by the teacher for each class individually, based on the unit being studied. This allows for training of the interpreter's skills without real-life stress and responsibility, at the same time giving the students an idea of real-life language and its realization. This type of training involves all the general language skills such as speaking. The student's book "English for Diamond Miners" includes a reading supplement sourced from official websites of the world leading diamond mining companies and on-line newspapers and magazines connected with the industry, such as www.debeersgroup.com, www.riotintodiamonds.com, www.riotinto.com, www.miningweekly.com, www.israelidiamond.co.il, www.jckonline.com, www.rough-polished.com, etc.

Recent investigations in the field of translation for expert communities highlight the necessity of developing creativity in the process of formation of socio-cultural competence [Telezhko et al., 2020]. Accordingly, the book includes tasks aimed at the development of creative thinking and problem solving skills, for example: "You are a representative of Alrosa company and you are interviewed by foreign journalists. They are interested in the history of mines of Mirny region. Think about the details" or "Imagine that you are a lecturer. Tell about the rocks of the Earth's crust using the following scheme".

In the end of the course, the study deepens in the direction of professional translation of texts of technical nature and specific subjects, and students undergo job training at ALROSA facilities and the preparation of the final qualification work (WRC) begins. The WCR includes translation of a scientific or technical paper published in industry media, compilation of a glossary and a theoretical analysis justifying practical translation strategy and solutions. The teacher selects the WRC topics so that they relate to the current or future professional activity of the student. For instance, in 2019 two co-worker students, employed by Alrosa's Economic Research Services, for their WCR translated 40-pages paper from on-line SAIMM Magazine, dedicated to the issues of pre-feasibility study for a mining project. The student from the same group, who later opted for a career in social services department of municipal administration, translated a paper on tailing dams' failure and its economic and environmental consequences, from Russian into English. In 2020 two students, working fulltime for Mirny

Polytechnic Institute and studying for their PhD degree, translated papers on subjects connected with their PhD thesis research, etc. Last two years students from the Philology department combine the WCR of the minor programme "Translation for expert communities" with the diploma thesis of their major programme.

Our curriculum is continuously updated. A practical course is being developed that will allow students to master the CATs and translation memory tools. A block of classes is devoted to development of the skills of literary and technical editing, including editing of machine translation. We are continually revising the content of the course in order to meet the requirements of modern language skills assessment approach, stated in Common European Framework of Reference (CEFR).

The work placement and job training. A few words about organising the work placement and job training. It is impossible to consider the issues of professionally oriented training in isolation from the context of the socio-economic situation in the region, where the diamond mining industry is one of the key taxpayers and employers. We have an agreement of understanding between Mirny Polytechnical Institute of Ammosov North-Eastern Federal University and Alrosa on the organisation of job training of the translator students. This complex process requires the cooperation of the educational institution and the employer. The arrangements for practices, logistics jobs, safety and security inductions are required, as well as HR formalization for the interns and mentor, funds for the salaries of interns and mentors' additional charge. To our great regret, the employer does not seek to actively cooperate with educational institutions in non-core areas. In the case of translation for expert communities, it is not obvious for the employer to benefit from such cooperation. In other words, we observe that work placement for engineering students is universally organised at Alrosa enterprises within the framework of their human resources policy and social projects, but when trying to organise the job placement for translation students, the MPTI faces a lack of active cooperation. There are several reasons to this, and first of all, any potential employer is interested in acquiring specific competencies by students, but becomes passive when it comes to non-core, general competencies that can increase the employee's competitiveness on the labor market (and in some cases, latently sabotages the acquisition of such competencies by their employees). That is, we underline, the motivation of students to improve their skills is the primary driving force behind the success of this educational programme.

In fairness, it should be noted that there are objective reasons for the employer's unwillingness to organise job placements, as Alrosa's sites are restricted access facilities: first, these are hazardous sites (mines, industrial

enterprises, processing plants), and second, they handle the diamonds. In other words, access to the company's facilities is limited due to the industrial safety considerations and security restrictions. Organising job placement requires training on industrial safety and labor protection, mandatory provision of protective clothing, safety shoes and personal protective equipment, and safety and security induction for the trainees. All this constitutes an immense responsibility for the employer. Simple postponing of terms by enterprises that are able to accept interns, leads to failure to meet the deadlines of the calendar schedules of the curriculum (where a certain amount of time is allocated for job placement or internship), which forces the MPTI to find alternative ways to organise language skill practice for students. Practical training is mainly limited to the translation of papers in industry magazines and scientific publications. We believe that in our case this is partially compensated by the work of students in industry museums and exhibitions (for example, in the D. I. Savrasov mineralogical Museum Savrasov or Alrosa Museum of History and Regional Studies and Industry Exhibition). On a positive note, the translation students who work for Alrosa can have their on-the job training and actualize their translation skills, though not formally.

In this regard, the authors concluded that it is students themselves who are primarily interested in acquiring foreign language communication skills.

Conclusion

That is, we underline, the motivation of students to improve their foreign language proficiency and thus to increase their individual value on the job market is the main driving force for their joining our training course. This reasoning contributes greatly to their decision to study and we used it to convince the students to join. In all cases, our students themselves pay for their study under our programme.

Over the years, the programme has enrolled 79 students, successfully completed the course 78 students, which, in our opinion, indicates the successful implementation of our educational project. Our graduates use the obtained knowledge in their professional and research activity, a number of students successfully work for Alrosa, RNG, city administration and other enterprises and organisations.

We conclude that the implementation of the programme "Translator for expert communities" in the diamond province enables students not only to gain additional skills and to improve English language proficiency, but also to learn about the region's history, culture and economy, and to mindfully contribute to society's development.

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RUSSIAN-JAPANESE STUDIES OF THE TUNGUS-MANCHU AND TURKIC LANGUAGES OF THE NORTH (LATE 20TH — EARLY 21ST CENTURY)

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Russian-Japanese scientific ties have a long history and traditions. They date back to the reign of Catherine II in Russia and the Edo period in Japan — the reign of the Tokugawa clan (1603–1868). Later, scientific work acquired the character of personal contacts of individual research scientists. For example, at the beginning of the 20th century, the Türkologists Radlov V. and Haneda T. worked together. During the Soviet period, due to the "Iron Curtain" there was a period of instability, but in the early 1990s, regular scientific contacts of researchers of the Turkic and Tungus-Manchu languages of Siberia were resumed and today they are successfully continuing. At present, Pevnov A., Burykin A., Petrov A., Barbolina A., and others are actively working on the Russian side in this area along with colleagues from Japan: Fujishiro S., Ebata F., Popova N., Tsumagari T., Kazama Sh., Kogura N., Matsumoto R., Kaji H., etc.

Keywords: history of Russian-Japanese scientific research, Turkic languages of Siberia, Tungus-Manchu languages, scholars of northern studies of Russia and Japan.

Introduction

Russian-Japanese cooperation in the study of the Tungus-Manchu and Turkic languages of the North in the modern history of Russia was founded in the 1990s. The first in this process were Petersburgers — lecturers of the Faculty of the Peoples of the North of Herzen Russian State Pedagogical University (Gladkova N., Petrov A., Artemyev N., Sverchkova Yu.), later joined by scientists of the Institute of Linguistic Research of the Russian Academy of Sciences (Shcherbak A., Pevnov A.). Further, the regions of Russia also joined this process, in particular: researchers of the Taimyr Autonomous Okrug (now a national district of the Krasnoyarsk Territory). On the Japanese side, scientists from the universities of Tokyo, Osaka, Kyoto, Kobe, Sapporo and other cities took part. Joint scientific expeditions were conducted to the places of residence of the Evenks and Dolgans, international conferences and symposiums were organised, and articles were published in Russian and Japanese journals.

However, the historical digression urges us to speak objectively and honestly about the development of Russian-Japanese scientific ties, starting as early as the XVIII century. Thus, it should be noted that Japan and Russia have a long tradition of cooperation both in the field of economics and diplomatic relations, as well as in scientific contacts. Back in the first half of the 18th century, in 1728, during the reign of Anna Ioannovna, a young Japanese called Gonza (1717–1739) after a shipwreck near Kamchatka came to St Petersburg in 1733, where he taught Japanese and even created the first Russian-Japanese dictionary (in a dialect of southern Japan). Unfortunately, Gonza died very young at the age of 21 after spending 10 years in Russia [Shichiro, 1985]. The tradition of diplomatic relations began during the reign of Empress Catherine II. The precedent arose when, in 1783, the Japanese captain Kodayu Daikokuya and his crew sailed to Amchitka Island (one of the islands of the Aleutian Archipelago, now Alaska, USA), then to Kamchatka, and met local people there.

The local population, Russian merchants, and officials helped Kodayu and his team. Kodayu Daikokuya and his colleagues travelled through Kamchatka, Okhotsk, Yakutsk, and Irkutsk. In Irkutsk, Kodayu met the scientist and civil servant K. Laxman, who was interested in the Japanese and became friends with Kodayu. At the suggestion of K. Laxman Kodayu decided to travel to St Petersburg to get permission to return to Japan from Tsarina Catherine II. With K. Laxman's help Kodayu travelled on the route Irkutsk — Krasnoyarsk — Yekateringburg — Kazan — Moscow. And in St Petersburg he had the honour to meet with the Empress and received permission to return to Japan. During almost a year of his stay in St Petersburg, Kodayu met more than once personally with the tsarina and her family members, as well as with the nobles, and there Kodayu told about Japan. Naturally, he also learned a lot about Russia. During almost ten years of being on the territory of the Russian state, Kodayu has seen and learned a lot about Russia. And, it is very likely that he himself told a lot about Japan during the Edo period, i. e. samurai time, despite the fact that he himself was not a samurai. Thus, it can be argued that mutual contacts with some scientific significance between Russia and Japan existed more than 200 years ago. Indeed, in 1792, by order of Catherine the Second, Ambassador A. Laxman, i. e. the son of K. Laxman, who helped Kodayu return to his homeland, escorted Kodayu and his colleagues who lived in Russia back along his route to Japan. Unfortunately, out of 17 people who accompanied Kodayu, only 3 people returned alive (since most of them died and 2 remained in Russia). After returning to Japan, due to the closure of the country by the Edo

government, Kodayu had to stay in detention on the territory of the capital of Edo (while he came from the western part of Japan) and tell, explain, and answer government's questions about Russia and his trip, etc. At that time, the Edo government did not agree to the proposal to conclude a trade agreement with Russia. But, nevertheless, a visit to A. Laxman is considered to have made a considerable contribution, since this was the first diplomatic visit in the history of relations between Russia and Japan. What D. Kodayu saw and learned in Russia at that time was reported in Japan through a series of drawings made by Kodayu himself or Katsuragawa with his artist, as well as through a story "Hokusa Bunryaku" [Kodayu, 1990], called "Brief News about Wandering in Northern Waters" (based on the notes taken by Japanese scientist Katsuragawa Hosyu at Kodayu's). The text and drawings with the Russian translation of "Hokusa Bunryaku" were also published in Russia with commentary and appendices in the series "Written Monuments of the East" vol. 41 by V. Konstantinov (It says "Hokusa Monryaku" instead of the correct Japanese name "Hokusa Bunryaku") [Konstantinov, 1978]. As an example, we would give a brief quote of the description of the Yakut population in the paragraph "Yakutsk": "The locals are called Yakuto. Their settlements are scattered between Okhotsk and Irkutsk. (Yakuts) — both men and women — braid their hair into braids. The hair and eyes (they have) are black. Clothes (they) sew from the skins of cows and horses. The clothes are spacious; the length barely reaches the waist. Woollen clothes are worn only by some of the rich Yakuts, but the underwear of both the noble and the rabble is made of linen" [Konstantinov, 1978, p. 109].

As for scientific cooperation between Russia and Japan, especially in the field of humanities, we cannot ignore the cooperation of V. Radlov (1837–1918) and T. Haneda (1882–1955) [Shogaito, 1998]. In 1914, T. Haneda, a Japanese orientalist, Turkologist, linguist, and Uighur scholar, came from Kyoto to St Petersburg to consult V. Radlov on the study of manuscripts in the Uighur language. At that time, T. Haneda was a young researcher, and V. Radlov was a famous scientist. T. Haneda greatly respected the professor. The scientists enjoyed good understanding of each other and spent fruitful time in scientific research. They worked on Buddhist sutras, including the Uighur version of "天地地" tngri burqan yrlïqamïš yirli tng'ri-li säkiz yükmäk yaruyy bükülük arvïš nom bitig", which Haneda clarified and identified the text from a set of voluminous Buddhist sutras. T. Haneda wanted to ask advice from V. Radlov. At that time V. Radlov was engaged in translating the Uyghur version of the SuvaraA-prabhāsa, and T. Haneda helped to check and compare the correspondence of the Uighur text with the Chinese sutra texts. After a short stay with V. Radlov, T. Haneda returned to Japan, promising further cooperation. Of course, their scientific contacts and cooperation

would have continued if there had not been for what happened in history in the first quarter of the 20th century. Professor V. Radlov died in 1918 and then unstable times came between the USSR and Japan, and the so-called "Iron Curtain" separated the countries for a long period.

Unfortunately, this "curtain" remained closed for a long time in the 20th century. Although scientific contacts between the two countries have not completely stopped, for example, scientists like H. Shiro, M. Shichiro, I. Jiro, and others continued to cooperate, but still it is not possible to speak about their active phase. While studies of modern non-Russian languages in the territory of the USSR in Japan were rather few, there were still fewer works on the languages of the indigenous peoples of the North, Siberia, and the Far East.

In the 80s of the 20th century, in connection with the development of the theory of linguistic typology, in the 1990s there was an increased interest in the so-called small languages with the purpose of their preservation and development. Unfortunately, the fear of scientists and the public for the fate the indigenous languages of ethnic minorities is justified every year. This is evidenced by the inclusion of almost all languages of the peoples of the North, Siberia, and the Far East in the "Red Book of Languages of the Peoples of Russia" in 1994 [The Red Book of the Languages of the Peoples of Russia, 1994]. In the next issue of this book, the languages of the northern peoples of Russia were also, without exception, classified as endangered [Languages of the Peoples of Russia, 2002]. In this situation, scientists from Japan and Russia, despite the difference in socio-political formation, showed the will and desire to study the living languages of the aborigines of the North and the Arctic.

By the late 1980s and early 1990s, the Iron Curtain began to gradually come up and a few years later, i. e. after 1991, it was finally lifted. A new stage in the history of Russian-Japanese studies of Altaic, Uralic, and Paleoasiatic languages has begun. Close scientific cooperation is being resumed in the field of studying both rarities — cultural monuments in ancient languages, as well as in studying and forcing the research of living languages.

As the late V. Radlov and T. Haneda, the orientalists in Russia and Japan began to cooperate again, including scientists from Kyoto (Kyoto State University) and St Petersburg (Institute of Oriental Manuscripts of the Russian Academy of Sciences (former Institute of Oriental Studies of the USSR Academy of Sciences). T. Nishida and E. Kychanov worked on monuments in the Tangut language, L. Tugusheva and M. Segaito studied the original Uighur manuscripts, T. Takada and I. Popova studied the Kyakhta pidgin language and others. Many scientists in Moscow, St Petersburg, Tokyo, Kyoto, and Sapporo, as well as in other cities of Russia and Japan have implemented

the results of their scientific work and joint successful cooperation through a number of published articles and books [Burykin, 2002, p. 63–67; Dolgan Language, 2007; Aksenova, 2007; Tugusheva et al., 1998; Kyakhta pidgin dictionaries, 2017].

On the basis of such a scientific tradition, the cooperation in the field of northern studies of Russia and Japan began to flourish during the new historical stage. This stage is characterized by the fact that direct scientific contacts have developed not only with researchers of well-known scientific and educational centres from the European part of Russia, but representatives of indigenous peoples from various regions of the North of Russia themselves have joined this scientific work. For example, at present, researchers from Japan have a unique opportunity to go on field trips to places of residence of indigenous peoples of the North, Siberia, and the Far East, to ask native speakers to record materials in their native language, and to constantly plan scientific events and conferences, etc. This marks the initial new stage of cooperation between Russia and Japan in the 21st century.

End of 20th century

The first scientific conference dedicated to the study of the languages of the peoples of the North was held in Japan in 1996. The organiser was professor M. Segaito from the Department of Linguistics of Kyoto University. Fujishiro S., a linguistics professor from Kobe College of Nursing, was among the initiators of this event at that time. From the Russian side, Doctors of Philology, Professors A. Shcherbak, A. Petrov, and N. Artemiev took part in it. On a scientific mission, they visited universities and scientific organisations dealing with the studies of the North and the Arctic in Tokyo, Osaka, Kyoto, and Sapporo. Japan's leading scientists J. Ikegami, M. Shogaito, S. Kazama, T. Tsumagari, T. Hayashi, M. Sugahara, and others showed great interest in the Japanese-Russian contacts in the field of Northern studies. A collection of conference materials was published, in which the participants' reports were published. For example, see one of our reports [Petrov, 1999, p. 33–41].

Early 21st century

At the beginning of the 21st century, these studies were successfully continued and the "Russian-Dolgan Phrasebook with translation into Japanese and comments" was published in 2007 (authors A. Barbolina, N. Artemiev, S. Fujishiro) [Dolgan Language, 2007].

Prior to that, A. Barbolina and S. Fujishiro, as part of a project at the Department of Linguistics of the University of Tokyo, published the complete works of the famous Dolgan poetess, the founder of the Dolgan writing O. Aksenova (Evdokia Egorovna Aksenova) in Dolgan, Russian and Japanese [Aksenova, 2007]. For the first time in history (not only of literary studies), poems arranged in several chapters became available to the readers: "Love for the Motherland", "History", "Seasons", "About man", "About Love", "Children's" [Aksenova, 2007, p. 1–202]. There are separate sections called "Songs" [Aksenova, 2007, p. 203–254], "Fairy tales" [Aksenova, 2007, p. 255–290], and "Proverbs, sayings, riddles" [Aksenova, 2007, p. 291–322]. The book has several appendices (photos, biographical information about the poetess, about the translator V. Kravets, maps of Taimyr [Aksenova, 2007, p. 323–382].

In February-March 2020, the fourth International Symposium on the Problems of Languages and cultures of the peoples of the North — the 4th International Symposium on Northern Languages and Cultures was held in Kushiro and Sapporo. The organiser was a project conducted by Kushiro University with professor Yu. Nagayama as coordinator. In addition to Japanese colleagues, professor A. Petrov, associate professor L. Zaksor (Herzen Russian State Pedagogical University, St Petersburg), V. Gusev (Institute of Linguistics of the Russian Academy of Sciences, Moscow), E. Kasten (Cultural Foundation of Siberia, Germany), etc. took part in the symposium.

Joint scientific research of the Russian and Japanese scientists on the study of languages and cultures of the Tungus-Manchu and Turkic peoples of the North continues successfully today [Popova and Fujihiro, 2006; Ebata and Popova, 2006; Kanchuga and Tsumagari, 2014; etc.].

It should be noted with satisfaction that the following scientists have been actively engaged in the study of Turkic and Tungus-Manchu languages in Japan and are currently working on the Yakut and Tuvan languages. Fuyuki, associate professor of Niigata University; on the Yakut language N. Popova, herself an ethnic Yakut /Sakha, lecturer of the Russian course Japan-Eurasia Society;on the Tungus languages I. Jiro, Emertus Professor of Hokkaido State University, Ts. Toshiro, Emeritus professor of Hokkaido State University, director of Hokkaido Museum of Northern Peoples;on the Nanaian language and others K. Shinjiro, professor of State University of Foreign Languages in Tokyo;on the Even and Samoyed languagesM. Ryo, associate professor of Kansai University of International Studies; on the Sibo dialect of the Manchu language, the language of the Sibo peopleK. Norikazu, associate professor of Research Institute for Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies; on the Even language K. Hiromi, assistant professor of Meikai University.

Conclusion

The history of diplomatic relations between Russia and Japan dates back to the 18th century, to the reign of Empress Catherine II and the Edo era in Japan. Subsequently, scientific contacts were established between scientists, as evidenced by the activities of V. Radlov and T. Haneda. At the beginning of the 20th century, scientists established personal cooperation with specific specialists and thus formed fruitful contacts in certain areas of scientific knowledge in the field of Northern linguistic studies. However, during the Soviet period, scientific contacts between Russia and Japan in all fields of science, including linguistics of the Northern languages, were partially put on hold.

New stages of interactions became possible only at the end of the 20th century; and a number of progressive trends in the aspect of humanitarian research began to be implemented. Until the 1980s, it was difficult even to imagine that Russian-Japanese cooperation in terms of studying rare languages of minority ethnic groups of the North, Siberia, and the Far East would reach such a high level. Currently, we can state that these studies have acquired a planned and systematic nature. This is evidenced by scientific conferences and symposia regularly held in Russia and Japan devoted to the study of languages and cultures of indigenous peoples of the North and the Arctic, and joint publication of books, articles, phrasebooks, dictionaries, etc. Today, we can undoubtedly say that our field of science is very promising in the future, despite the fact that the so called "small languages" are rapidly decreasing their power and scope of use. However, the cooperation with scientists from various countries of the world (USA, Canada, France, Finland, Norway, Korea, etc.) enhances the energy of research and the struggle for the preservation and development of the languages and cultures of the indigenous peoples of the North and the Arctic by various means and ways. In this series, the studies of scientists from Russia and Japan occupy a special place and make a significant contribution to the noble cause of preserving and developing the languages of the indigenous peoples of the North, Siberia, and the Far EaSt.

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ARCTIC SCIENCE DIPLOMACY: THE RUSSIAN APPROACHES

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This paper examines various Russian approaches to the study of Arctic science diplomacy (ASD), including its nature, strategic motivations and driving forces. There are three main approaches to ASD: firstly, there is a technical/instrumentalist approach, which views ASD as an expanded form of international science cooperation. In other words, ASD is the use of scientific-technological and academic collaborations among countries, regions and societies to address common issues and build strong international partnerships on the non-ideological basis. Secondly, some academics and practitioners see ASD as regional players' soft power instrument. Science diplomacy helps to promote a positive image of specific countries and get access to non-state resources which are normally unavailable for traditional/state actors. Thirdly, there is an interpretation of ASD as a form of "new" (public) diplomacy which aims not only to foster international scientific cooperation and improve Moscow's international image but also to build friendly and cooperative relations with all the Arctic players.According to this school which tries to embrace the two former approaches, both government and non-government actors should be involved in ASD and state and non-state players should be targeted in foreign countries.

Keywords: Arctic, science diplomacy, Russia, international cooperation, soft power, public diplomacy.

Introduction

As the most recent Russian strategic documents demonstrate, Moscow views Arctic science diplomacy (ASD) as an effective foreign policy instrument to enhance international cooperation in the region. Russia's Arctic research agenda includes the following priorities: (1) global climate change; (2) ice dynamics; (3) permafrost; (4) continental shelf; (5) AZRF mineral resources; (6) conservation of Arctic flora and fauna; (7) socioeconomic implications of climate change, and (8) indigenous peoples[1]. Moscow plans to invite foreign scholars to the Russian Arctic expeditions and polar stations,

[1] On the Strategy for the Development of the Arctic Zone of the Russian Federation and Ensuring National Security up to 2035: official text: as for: 26.10.2020. URL: http://static.kremlin.ru/media/events/files/ru/J8FhckYOPAQQfxN6Xlt6ti6XzpTVAvQy.pdf (accessed: 07.03.2021). (In Russian)

including an international Arctic Hydrogen Energy Applications and Demonstrations station 'Snowflake' (in the polar Ural)[2].

In other words, the Kremlin believes that science diplomacy can contribute to the process of making the Arctic a 'zone of peace and stability' — the thesis which is present in all Russia's Arctic-related strategic documents.

ASD is both a relatively new theme and a vexed question in the Russian academic and policy-making communities. There is neither a clear-cut definition of the concept nor a consensus on science diplomacy's nature, problematique, stakeholders, instruments and activities.

This study aims to examine how various Russian schools define ASD, explain its nature, strategic motivations and driving forces. The paper is structured in a way to explore three main Russian theoretical approaches to ASD, such as technical/instrumentalist, soft/smart power and "new" (public) diplomacy ones.

Technical/Instrumentalist Approach

Currently, the technical/instrumentalist approach to ASD has become quite popular in the Russian academic and political communities. For this approach, ASD is the use of scientific-technological and academic collaborations among countries, regions and societies to address common issues and build strong international partnerships on the non-ideological basis (see figure 1). Furthermore, these activities and resulting networks offer excellent opportunities to share resources, organisational capacity and expertise, open countries up to better funding opportunities from international sources.

The technical/instrumentalist approach defines science diplomacy as a set of interlinked but definable cognitive practices, such as enquiry, providing empirical evidence, compiling databases, reporting, and consulting. These practices arise and are maintained at the level of everyday and routine activities through research institutions, laboratories, universities, conferences, seminars, workshops and other academic forums. ASD takes on a network character, caused by the need for coordination of efforts and timely communication for implementation of various research projects.

The ASD has already demonstrated its global importance, which is confirmed by the above-mentioned Agreement on Enhancing International Arctic Scientific Cooperation signed by the Foreign Ministers of the eight Arctic countries, as well as the Governments of Greenland and the Faroe

[2] Interview of the Ambassador at large of the Russian Ministry of Foreign Affairs N. Korchunov. *Kommersant* 15.01.2021. URL: https://www.mid.ru/arkticeskij-sovet/-/asset_publisher/0vP3hQoCPRg5/content/id/4525318 (accessed: 07.03.2021). (In Russian)

Islands on 11 May 2017 at the Arctic Council Ministerial Meeting in Fairbanks.

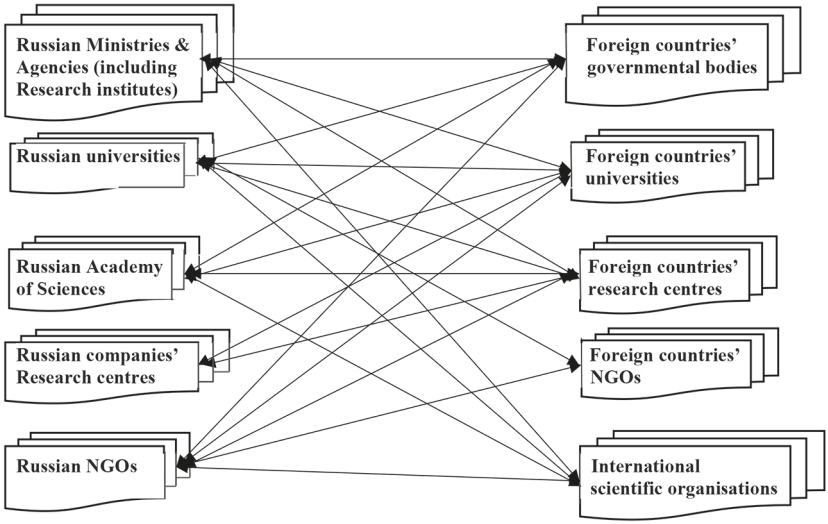

Fig. 1. International scientific cooperation in the Arctic

According to N. Antyushina (Institute of Europe, Russian Academy of Sciences), joint scientific activities of the countries in the Far North are developing quite actively, which allows states to collect a fairly complete array of data. She notes: "…the countries are willing to combine their efforts in this regard and agree to exchange the results of their observations" [Antyushina, 2013, p. 45]. The researcher also rightly says that the Arctic is an innovative region, "a kind of laboratory for establishing international cooperation on a wide range of issues". In a rather pragmatic way, she believes that international scientific cooperation could help Russia to solve most pressing problems of the AZRF and ensure this region's sustainable development. The scholar suggests some practical recommendations on how to help Arctic researchers: "We just need to create the necessary conditions for them within the framework of venture zones (technology parks, technopolices, business incubators, etc.), provide them with infrastructure and information support, provide them with reasonable tax incentives on well-justified terms, and provide them with public and private orders" [Antyushina, 2013, p. 46].

According to the "instrumentalists", ASD should aim at an organised and coordinated transition of Arctic countries to the principles of sustainable development. ASD is designed to help prevent the predatory use of the region's resources, to ensure the use of the necessary innovative technologies,

to establish a management system that will consistently pursue a course for sustainable development of the region without causing irreversible damage to Arctic ecosystems and keep the Arctic nature for the future generations.

It is characteristic that not only scientists, but also representatives of Russian state institutions dealing with the problems of the Far North, prefer to consider ASD in the framework of the instrumentalist approach. For example, at the "Days of the Arctic and Antarctic in Moscow" held on 25–27 November 2020, it was noted that during its chairmanship of the Arctic Council, Russia will rely on a strong foundation of Arctic scientific cooperation. According to Russia's representative in the Arctic Council Ambassador N. Korchunov, to make Russia's presidential agenda really comprehensive and cover all three components of sustainability — the economic, environmental and social ones — Moscow's policies should be based on scientific approach. He noted: "The scientific approach allows us to build policy in the Arctic in the most optimal and effective way. This includes meteorological cooperation and cooperation in the field of maritime activities, to which we will also pay the closest attention during the Russian chairmanship"[3].

Russian-American scientist A. Petrov, ex-president of the International Arctic Social Sciences Association (IASSA), notes the special importance of social sciences in Arctic science diplomacy, which "play an important role in understanding what and how we need to do in the Arctic — talk to people, get data on economic, social, and demographic development — this is all a priority if we want to ensure the sustainable development of the region"[4]. One of the main platforms that contribute to the ASD development, according to the scientist, is the International Congress of Arctic Social Sciences, which takes place every three years.

Another Russian researcher N. Kharlampieva (St Petersburg University) "identifies important reasons for significant changes in the study of the polar region: a) the use of knowledge to create a common environment protection space; b) the growing opportunities to transform research expeditions into scientific and educational tourism; and c) the internationalization of the research and educational system" [Kharlampieva, 2017, p. 5]. According to the author, the main condition for understanding the current characteristics of ASD is to identify the existing and potential stakeholders of Arctic international scientific cooperation, as well as to study changes in the ways of decision-making at the global, regional and national levels. Kharlampieva N. [2017, p. 5] believes that the ASD main research object

[3] Days of the Arctic and Antarctic in Moscow. *International Arctic Forum. 25–27 November — 3 December 2020.* URL: http://arctic-days.ru (accessed: 13.01.2021). (In Russian)

[4] Ibid.

should be "the process of formation of the Arctic regional innovation system", and the subject of research should be "the improvement of strategic scientific planning and making the decision-making process more effective".

Some Russian scholars see ASD as an important resource for the development of universities, since through joint research activities it is possible to obtain unique and relevant scientific knowledge and understand the processes taking place in the region. An expert from the Northern (Arctic) Federal University emphasizes: "…the direction that we are currently developing and supporting — science diplomacy and a constant dialogue of experts from the scientific community and authorities at all levels — is what is needed today in the Arctic precisely: to make the results of scientific research a solid basis for informed decisions"[5].

Critics of the instrumentalist approach, however, point to the fact that its proponents significantly narrow the meaning of ASD, reducing it to the cooperation of scientists in functional areas and utilitarian attitude to the results of this cooperation, applying them only to solve specific technical or administrative/managerial problems of the Arctic. According to these critics, the "instrumentalists" do not notice that ASD has much more potential than simply expanding scientific cooperation to solve the practical problems of the Far North [Krynzhina, 2018; Romanova, 2018].

Arctic Science Diplomacy as a Soft/Smart Power Instrument

Proponents of this approach draw attention to the fact that against the background of active development of cooperation and international activities in the scientific field, developed countries with Arctic ambitions have begun to use science diplomacy to strengthen their innovative status and improve relations with other countries in the region. The scientific attractiveness of the state is one of the essential features of the ASD soft power (see fig. 2). The countries that occupy leading positions in the soft power ratings are very active in science diplomacy in the Arctic region. Such states include the United Kingdom, Germany, France, Switzerland and Japan, i. e. countries that are not Arctic states and have only an observer status in the Arctic Council. Due to their scientific activity, they have gained great authority in the field of Arctic research, and the "official" Arctic countries have to reckon with them in matters of regional policy. Of course, science diplomacy itself is not an indicator of the soft power attraction, but science itself is a channel for the spread of this power, and the effectiveness of scientific and diplomatic networks is another element of soft power.

[5] Ibid.

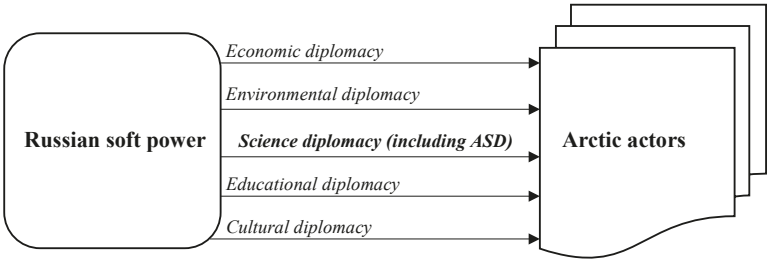

Fig. 2. Science diplomacy's place in Russia's soft power strategy

Todorov A. (the Institute of World Economy and International Relations, Russian Academy of Sciences) convincingly shows how various countries effectively use ASD to promote their national interests in the region. For example, in one of his articles, he demonstrates how the UK quite successfully builds bilateral cooperation with the Arctic countries, relying on science diplomacy [Todorov and Lyzhin, 2019, p. 93].

Many Russian academics and practitioners believe that Russia can creatively use other countries' experience and apply ASD as its soft/smart power instrument in the region. The proponents of this school believe that science diplomacy could help to promote Russia's positive image in the High North, change international partners' foreign policy behaviour and get access to non-state resources which are normally unavailable for traditional/state actors. This school of thought follows J. Nye's [2004, p. 11] understanding of soft power, first and foremost, as an ability to be attractive. Russia demonstrates its willingness to partake in all large-scale international projects on the Arctic and the work of professional associations, such as IASC, IASSA and Association of Polar Early Career Scientists (APECS). Russian experts are very active in all Arctic Council's working and expert groups. Russia invites foreign scholars to work together at the polar stations in Barentsburg (Spitsbergen/Svalbard), Chersky (Yakutia) and "Snowflake" (Yamal) as well as to the Russian Arctic land and sea expeditions.

Professor A. Pelyasov (Moscow State University) sees science diplomacy as the basis of Russia's "soft power" in the region. According to the researcher, ASD is an important tool with which Russia is able to maintain the status of the world's Arctic leader. At the same time, Professor A. Pelyasov notes that "the country that has the largest territory and water area in the Arctic zone is no longer a leader in any of the new areas of Arctic research, which is a dangerous paradox"[6].

[6] Pelyasov A. Research and innovations in the Arctic region 16.08.2012. URL: https://russiancouncil.ru/analytics-and-comments/analytics/nauchnye-issledovaniya-i-innovatsii-v-arkticheskom-regione/ (accessed: 28.03.2021). (In Russian)

Pelyasov believes that, for Russia, science diplomacy is the key to maintaining control over the Arctic territories. He underlines: "Russia needs to be present at all international scientific forums, participate in international research projects, and initiate them itself in order to acquire the new world knowledge about the Arctic territories, the knowledge which has been accumulated over the past one and a half to two decades and is rapidly being updated from year to year"[7]. The scientist believes that the Russian Federation should recognise the internationalisation of research in the Arctic that has already taken place and shift the main focus of the discussion to defending Russia's national interests. In this regard, the main task of Russia's ASD should be launching its own research initiatives in priority areas to address existing research gaps.

In their joint work, N. Zamyatina and A. Pelyasov suggested the idea of creating an Arctic regional science. According to the researchers, the cementing factor for its creation is "the highly specific environment of the Arctic itself, the study of which requires an interdisciplinary synthesis of sciences that study the properties of this space" [Zamyatina and Pelyasov, 2017, p. 7]. An open project of a new Arctic science, according to N. Zamyatina and A. Pelyasov, will contribute to the consolidation of intellectual efforts aimed at a better understanding of the region.

In many ways, the popularity of the soft power approach to ASD is associated with the positions of the Russian political elite. Currently, the Russian government is showing interest in ASD as a geopolitical tool for influencing political processes in the High North and a soft power instrument. Russian top officials' statements, as well as some normative and doctrinal documents provide an evidence that the Russian political leadership is well aware of both potential advantages and threats that soft power can hide in itself, as well as the soft power venues and instruments.

The promotion of Russia's positive image abroad is considered to be an important priority in its soft power strategy. The 2013 Russian Foreign Policy Concept emphasised that this should be done through the development of "effective means of information influence on public opinion abroad' as well as through strengthening the positions of the Russian language and culture abroad…"[8].

The critics of the soft power interpretation of ASD, however, point out that Russian interpretation of the soft power concept strongly deviates from the one suggested by its author J. Nye. According to Nye, soft power is one of

[7] Ibid.

[8] Putin V. Foreign Policy Concept of the Russian Federation: official text: as of 12.02.2013. URL: https://www.garant.ru/products/ipo/prime/doc/70218094 (accessed: 12.01.2016). (In Russian)

the three possible ways to exercise power and accomplish an actor's goals — coercion, payment or attraction — and he associates soft power with the latter method. However, as J. Nye emphasises, powers such as Russia, who proclaimed their adherence to the soft power concept for various reasons, fail to become attractive to targeted international audiences. According to J. Nye, one of the basic mistakes made by Russia is that it did not realise that "the development of soft power need not be a zero-sum game. All countries can gain from finding each other attractive"[9]. Many Russian soft power initiatives (including ASD) often pursue overtly pragmatic, interest-based goals rather than aim to take into account international partners' interests and, for this reason, are met with suspicion or even hostility [Sergunin and Karabeshkin, 2015]. The Russian ASD is often perceived by other regional players as a continuation of Moscow's "expansionist" policies in the Arctic but by different (non-military, non-propagandist) methods.

Arctic Science Diplomacy as a "New" (Public) Diplomacy

Another school believes that both the instrumentalist and soft power approaches are too narrow and do not reflect all ASD dimensions. This school tends to interpret ASD as a form of "new" diplomacy which has become an umbrella term to describe a number of state and non-state, formal and informal technical, research-based, and academic exchanges, joint projects, network-type collaborations, academic forums, within the general field of international relations. Science diplomacy, along with economic, cultural, sport, digital, non-state, and paradiplomacy, is a subcategory of the so-called "new diplomacy", as opposed to the traditional state-centric diplomacy. In contrast with the latter, ASD exploits not only state but also non-state actors and institutions for communicating foreign partners which also include government and non-government actors (see fig. 3). Depending on the nature of inter-state relations ASD can target either governmental or non-governmental counterparts or both.

For this school, the aim of ASD is not only to improve Russia's international image and make this country an attractive international partner (as the soft power approach suggests) but also to engage in a substantive and long-term cooperation with a foreign country's academic community with the purpose to solve most important theoretical and practical problems related to Arctic research. Furthermore, building upon successful research

[9] Nye J. What China and Russia Don't Get about Soft Power. Foreign Policy. 29.04.2013. URL: https://www.foreignpolicy.com/articles/2013/04/29/what_china_and_russia_don_t_get_about_soft_power (accessed: 24.04.2018).

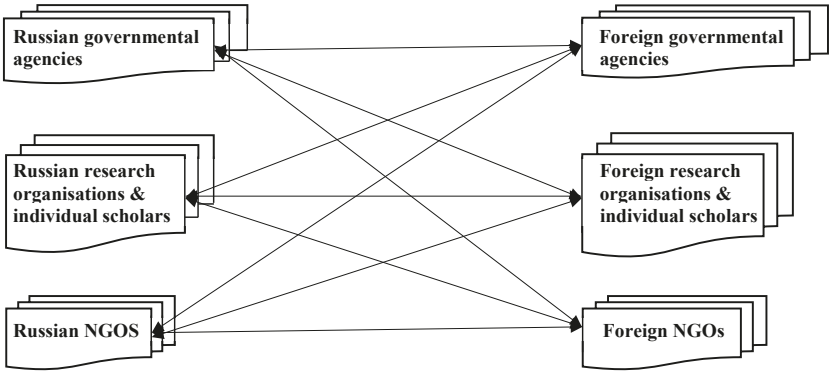

Fig. 3. ASD's place in Russia's public diplomacy
Source: author.

cooperation and generating a spill-over effect, ASD aspires to improve the overall state-to-state and society-to-society relations.

In fact, this approach does not deny the two previous ones; rather, it tries to incorporate them and subordinate them to a more general strategic goal — use ASD for establishing good/cooperative relations with all the Arctic players. To compare this theoretical approach with its competitors, it looks more reasonable, comprehensive and preferable for explaining the nature of ASD and building ASD strategies (see table 1).

The adherents of this school believe that ASD is especially important in the current international situation when relations between Russia and the West are tense and even continue to deteriorate. They point out that a situation in which domestic and international political tensions build barriers hindering cross-boundary connections is more frequent than times of détente. Cold War science left a legacy of tunnelling through such barriers, providing a model that can be useful today.

At the peak of the Cold War in 1972, the U.S. and the Soviet Union signed several agreements, one of which, known as the "Environmental Bilateral" established the joint Commission on Environmental Protection [Robinson, 1988]. During an era of political tension, it brought together a multidisciplinary group of top professionals and early carrier scientists in both countries. Acting through science diplomacy, this group communicated strong scientific messages about global climate change to top level policymakers well before the United Nations' Intergovernmental Panel on Climate Change came into existence.

The many scientific activities carried out under Environmental Bilateral auspices culminated in an official communiqué from the 1986 summit

Table 1. **Three theoretical approaches to ASD: comparative analysis**

ASD characteristics	Technical/ instrumentalist approach	Soft power approach	"New diplomacy" approach
ASD strategic goal	Enhance international scientific cooperation in the Arctic	Improve Russia's image, make it more attractive for international partners in the Arctic	Two above goals + establish better relations between Russia and other Arctic state and non-state actors
ASD actors	State and non-state actors with prevalence of state players	State actors	Equal participation of state and non-state actors
ASD outcomes	Sustainable, long-term academic partnerships, joint research projects	Russia's more attractive image	Two above outcomes + Russia's improved relations with Arctic state and non-state players; the Arctic is a region of peace and stability
ASD research agenda	Natural sciences-oriented	Public policy-oriented	Natural and social sciences-oriented

S o u r c e: author.

meeting between President Reagan and General Secretary Gorbachev in which they called for a joint U. S.—Russia report on climate change.

The joint report came out in 1990 as a book entitled *Prospects for Future Climate* [MacCracken et al., 1990], and its contents hold up well even now. The document correctly anticipated increasing temperatures, particularly in high latitudes and during the winter, and increasing precipitation in some areas.

The success of those efforts provides hope for current times. Many Russian and foreign scholars believe that similar models today can help the West and Russia remove obstacles for scientific collaboration and implement the Agreement on Enhancing International Arctic Scientific Cooperation signed by all eight Arctic countries in May 2017 [Anisimov et al., 2020].

It seems that the Kremlin acknowledges an important role of science diplomacy in the whole system of Russia's public diplomacy which aims to reach other countries' societies, not only governments. For example, the Presidential Decree of 2016 "On the Strategy of Scientific and Technological Development of the Russian Federation" emphasises that science diplomacy

is a kind of public diplomacy. In accordance with this strategic document, science diplomacy is one of the mechanisms which protect the identity of the Russian scientific sphere and state interests in the context of the growing internationalization of science, as well as to increase the effectiveness of Russian science through mutually beneficial international cooperation[10]. In this case, one of the main Russia's ASD functions is the formation and promotion of scientific agendas of international organisations dealing with the Arctic, as well as increasing the level of Russia's participation in international systems of scientific and technical expertise and forecasting regional developments.

Some representatives of the Russian academic community believe that scientific cooperation in the Arctic can significantly reduce geopolitical tensions in the region. According to Dr. O. Krasnyak (Higher School of Economics), effective science diplomacy has a real potential for reducing tensions between nations, finding ways to improve people's lives and bring the world closer to solving global and regional problems. The scientist believes that "Russia's compliance with international treaties, for example, the Arctic treaties…, as well as participation in international scientific projects, such as the International Space Station, allow Russia to maintain its position as a reliable partner for other countries" [Krasnyak, 2018, p. 75]. Following the author's logic, we can conclude that the lack of Russia's effective ASD can lead to the destabilisation of existing scientific partnerships and the loss by Russia of the status of a leading regional power.

In an article co-authored with prominent Western Arctic researchers, Professor A. Vylegzhanin (Moscow State Institute of International Relations) emphasised the importance of the 2017 Agreement on Enhancing International Arctic Scientific Cooperation for the development of scientific-diplomatic practices in the region. According to the scholar, this agreement confirms the global importance of ASD, which allows for productive cooperation when diplomatic channels between countries are unstable. The authors note: "In the Arctic, as elsewhere, science diplomacy helps to balance national interests and common interests for the lasting benefit of all on Earth with hope and inspiration across generations" [Berkman et al., 2017, p. 598].

The authors suggested some practical recommendations to implement the agreement, such as to (1) establish procedures to expedite the granting of visas and permits for accessing field sites; (2) digitise historic and other data from hard-copy formats and create shared platforms for searching data

[10] On the Strategy of Scientific and Technological Development of the Russian Federation: official text: as of 01.12.2016. URL: http://kremlin.ru/acts/bank/41449/page/2 (accessed: 22.11.2020). (In Russian)

located in a variety of repositories, including coordination with the Arctic Data Committee and Sustaining Arctic Observing Networks; (3) use organisations mentioned in the agreement to set up and monitor research partnerships across borders; (4) increase support for field and summer schools and related means for training the next generation of Arctic scientists; (5) promote well-formulated comparative studies designed to examine common issues at multiple locations across the Arctic; (6) maximise the use of icebreakers and other forms of infrastructure for scientific purposes, and (7) create innovative venues that integrate natural and social sciences along with indigenous knowledge to address common concerns [Berkman et al., 2017, p. 596].

Another group of Russian and American scholars suggested some additional implementation measures: The Arctic countries should facilitate access by the agreement's participants to national civilian research infrastructure and facilities and logistical services such as transportation and storage of equipment and material as well as to terrestrial, coastal, atmospheric, and marine areas in the identified geographic areas, consistent with international law, for the purpose of conducting scientific activities. They also should support full and open access to scientific metadata and should encourage open access to scientific data and data products and published results with minimum time delay, preferably online and free of charge [Anisimov et al., 2020].

The Russian experts believe that lowering the obstacles to collaboration will allow scientists to develop their potential to reduce the broader policy conflicts. While scientist-to-scientist contacts cannot resolve the concrete disputes between the West and Russia, they can help to create multiple arenas of contact. Working together to address issues such as increasing resilience to climate change, conservation of biodiversity, improving weather forecasts and ensuring maritime safety in the Arctic may ultimately provide the basis for other models of conflict resolution.

Conclusion

Several conclusions emerge from the above analysis.

First, there is still no common understanding of the "Arctic science diplomacy" concept among Russian scientists and politicians, although it is firmly embedded in the Russian scientific and political lexicon and is actively used both by scientists and by politicians responsible for the development and implementation of the Arctic science strategy.

Second, the Russian discourse is dominated by the understanding of ASD as a tool for establishing scientific relations with foreign colleagues to

solve common problems, build strong international partnerships on a non-ideological basis, gain a better access to foreign partners' research infrastructure and additional sources of funding.

Third, a part of the Russian political elite and academic community perceives science diplomacy as an effective tool of Russia's soft/smart power in the Far North. Given the fact that Russia seeks to avoid the militarisation of the region and the aggravation of relations with Western countries in the Arctic and, on the contrary, to turn it into a region of peace and cooperation, it can be assumed that the role of the ASD in the overall system of the Russian soft power strategy will only increase.

Fourth, in the Russian academic and political discourses, the interpretation of ASD as a form of "new" (public) diplomacy (along with economic, environmental, digital, cultural, sports, etc.) is gradually gaining strength. This approach does not have a pronounced state-centric character, but, at the same time, it does not refuse to coordinate its activities with official diplomacy. Proponents of this interpretation of the ASD believe that in the current conditions of strained relations between Russia and Western countries, non-state or less formal diplomacy can achieve more than official science diplomacy. To some extent this approach to the study of ASD tries to integrate two former approaches (state-driven promotion of international scientific cooperation and efforts to improve Russia's international image) into a single strategy which uses ASD for changing Moscow's relations with Arctic players (state and non-state) in a positive/cooperative way.

Fifth, most ASD stakeholders share the idea that international cooperation between scientists to ensure the sustainable development of the Arctic can become an effective tool for solving the most acute problems of the Far North, as well as for improving Russia's current relations with the West.

Sixth, it seems that the present-day Russian ASD is implemented in more dynamic and global forms. This is largely due to the fact that Russian ASD actors have strengthened cooperation not only with the Arctic, but also with non-Arctic countries, which generally favour Russia and its scientific activities in the Arctic.

However, it would be premature to assume that the Russian ASD has acquired complete and mature forms and is absolutely effective. It should be noted that Moscow's science diplomacy in the Arctic is still largely work in progress. It remains to be seen which shape the Russian discourse on ASD and ASD strategy itself will take in a foreseeable future and whether Moscow will be able to provide synergy between ASD and other components of its northern strategy.

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A RESEARCH ON FOSTERING KNOWLEDGE CREATION THROUGH ARCTIC SCIENCE DIPLOMACY

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Knowledge creation, as a well-established term within innovation literature, fundamentally stands for a set of social practices advancing knowledge of a community over time. Since the knowledge creation process involves more than the formulation of a new idea, science diplomacy holds the potential to provide goals and discourse, promotion of new ideas as well as evaluation of the state of knowledge within a community. Accordingly, the main aim of this study is to investigate the role of Arctic science diplomacy in knowledge creation. It is found that practices of Arctic science diplomacy, such as the Multidisciplinary Drifting Observatory for the Study of Arctic Climate (MOSAIC) Expedition, have established a common ground for scientific knowledge creation and therefore, have become a useful method for addressing global challenges.

Keywords: Arctic, Arctic science diplomacy, knowledge creation, research communities, science diplomacy

Introduction

Knowledge creation is basically described as developing new ideas to sustain innovation [Engeström, 2001]. A more detailed definition explains the term by referring as "ecology of innovation" since "a dazzling variety of new products" are produced each year [Gundling, 2000, p. 14]. Since knowledge creation process is closely linked to the knowledge management, it is essential to implement an effective strategy for the management of knowledge within organisations. In literature, one of the most detailed definitions of the term explains knowledge management as the following: "the practice of selectively applying knowledge from previous experiences of decision making to current and future decision making activities with the express purpose of improving the organisation's effectiveness" [Jennex, 2005, p. 2].

In recent years, scientific activities and knowledge creation have become important components of the foreign policy due to global challenges such as climate change and food security. The emergence to track two diplomacy, which is also known as backchannel diplomacy, highlighted a multi-sided type of diplomacy including non-state actors and their practices to manage and resolve conflicts. Herein, nongovernmental organisations as well as universities have become important actors to offer resolutions via formulating open-minded, strategically optimistic, and altruistic interac-

tions [Diamond and McDonald, 1996]. Accordingly, in today's world, the tools, techniques, and tactics of foreign policy ought to comply with a world of increasing scientific and technical complexity.

While the depletion of natural resources has carried the term sustainability at the top of the global agenda, a new era in which scientific knowledge is applied to address these global challenges properly has begun. The term science diplomacy has been institutionalized recently as a new field of discussion in international relations but the relationship between science and policy has deep roots throughout history [Berkman, 2019]. Based upon recent developments, the main aim of this study is to investigate the role of Arctic science diplomacy in knowledge creation. After brief discussions on the emergence of science diplomacy, Arctic science diplomacy and the creation of research communities, the MOSAIC Expedition is examined as a case. Conclusion part further discusses the future projections.

The Emergence of Science Diplomacy as a New Field of Discussion

According to the extant body of literature, the term science diplomacy has emerged upon the Antarctic Treaty Summit [Berkman et al., 2011] since the first book explaining the term in detail was published during the Summit. While the traditional taxonomy of science diplomacy was outlined by the American Association for the Advancement of Science (AAAS) and the Royal Society in 2009, the first definition is asserted as "the use of scientific collaborations among nations to address the common problems" [Fedoroff, 2009, p. 9]. The traditional taxonomy of science diplomacy, science in diplomacy, diplomacy for science, and science for diplomacy has been used since then.

In the following years, the Centre for Science Diplomacy was established within AAAS in 2008 and the publication of the 'Science&Diplomacy' Journal has accelerated the institutionalization of the concept [Turekian and Neureiter, 2012]. However, the concept of science diplomacy is often mistakenly confused with the internationalization of research. The major difference between the two terms was pointed as: "by virtue of its direct relationship to government interests and objectives, science diplomacy differs from international scientific co-operation, which is sometimes commercially oriented and often without direct state participation" [Copeland, 2016]. Political will and diplomatic involvement are added to the preconditions of science diplomacy in later studies [Krasnyak, 2020]. The next session examines Arctic science diplomacy and the creation of research communities across the Arctic.

Arctic Science Diplomacy and the Creation of Research Communities

Some studies outline Arctic science diplomacy as a continuation of track two diplomacy [Bertelsen, 2020] which is characterized by broad, multilateral, and informal approach to diplomacy based upon non-state actors including academic experts as well as non-governmental organisations that can produce scientific knowledge and implement technological innovation. Since the polar regions are characterized by a high level of international scientific activity, science diplomacy is perceived as a tool of statecraft for strengthening international relations. In this process, inter-state relations and cooperation have been propelled by science diplomacy in which transatlantic relations broadly operate across a 'continuum of urgencies' [Berkman, Kullerud, Pope, Vylegzhanin and Young, 2017: 596].

The emergence of new shipping lanes, commercial fishing areas, and tourism due to the shrinking and thinning of sea ice and the melting of glaciers can be enlisted among the continuum of urgencies in the Arctic [McGuinnes, 2009]. As the global challenges have raised common concerns, appropriate methodologies, based upon all disciplines of scientific research as well as Indigenous knowledge, are tried to be developed in order to enhance research capacities. Associated networks are essential for the effective implementation of science diplomacy. Therefore, several research communities have been established as a result of the successful implementation of science-oriented foreign policy [Berkman, 2019].

Moreover, the establishment of the Arctic Council as a high-level forum in 1996, endorsed scientific organisations conducting Arctic research [Berkman et al., 2017: 596]. In order to broaden the capacity of the High North through research, education, as well as outreach, the Council initiated the international UArctic network in which universities, research institutions, and organisations conducting circumpolar studies have been united. Besides, a science diplomacy thematic network within the UArctic was created[1].

Although major research gap exists in studies of Russian science diplomacy, there has been an increasing awareness among the Russian academic community since the Murmansk Initiative. In addition to a highly active group of regional actors in the Russian Arctic, the term was used by some

[1] Science Diplomacy Center. 2019. Science diplomacy action: An incidental serial for rigorous Meeting syntheses. Synthesis 3. URL: https://www.uarctic.org/media/1599347/science-diplomacy-action_synthesis-no-3_arctic-science-agreement-dialogue-panel_supporting-implemention-of-the-arctic-science-agremenet-_31jan19.pdf (accessed: 30.11. 2021).

candidates of the presidential election for the Russian Academy of Sciences (RAS) in 2017. In the same year, a discussion event on American-Russian cooperation in the Arctic and science diplomacy was organised by Russian International Affairs Council [Krasnyak, 2020]. Besides, the 'Seventh Annual Meeting of the Global Research Council' in 2018 highlighted the term science diplomacy as the major topic [Kharitonova & Prokhorenko, 2020]. Another study examines the case of Murmansk and further explains the mechanisms and the regional actors of Russian Arctic science diplomacy[2].

Russian scholars increasingly attend and explain their roadmap during international conferences such as the *Arctic Frontiers* and the *Arctic Science Summit Week*. 90 major events are planned to be organised within 11 regions in which about 12.500 people are expected to participate during the Russian Chairmanship of the Arctic Council[3]. The existing collaboration between RAS, British Antarctic Survey (BAS), and Scott Polar Institute (SPRI) is a prominent case for Arctic science diplomacy. They co-organised a conference titled '*Remote Sensing of Vegetation at High Latitudes in Response to Climate Change and Other Disturbances*' in February 2021. In terms of long-term environmental change, international cooperative groups have been organised such as DIMA (Developing Innovative Multi-proxy Analyses-in Siberia and the Russian Far East) Network. Furthermore, with its three branches, seven institutions and divisions, about 500 researchers, and a research base in Barentsburg on Svalbard, *Kola Science Centre of the Russian Academy of Sciences* steps forth as a successful institution in terms of Russian science diplomacy in the Arctic. In addition to holding partnerships with more than 20 countries and 100 organisations, Kola Science Centre is also an active part in 42 legal agreements with international partners, it is represented in 19 international organisations such as IASC and UArctic and it has implemented 23 large-scale international projects such as 'Phenomena of Arctic Nature' and 'Geo-Bio Hazards in the Arctic Region'[4]. Therefore, it could be concluded that Arctic science diplomacy has been evolved into a new phase oriented by international cooperation among reseach communi-

[2] Zaika Y. 2019. Cross-border cooperation as the factor for regional self-development in the Russian Arctic (by the example of Murmansk region). Corporate Governance and Innovative Economic Development of the North: *Bulletin of Research Center of Corporate Law, Management and Venture Capital of Syktyvkar State University 4*:43–53.

[3] The Arctic. 2021. About 90 events to be held during Russia's Arctic Council Chairmanship. URL: https://arctic.ru/international/20210218/991125.htm (accessed: 02.12. 2021).

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ties. Accordingly, the next session investigates the MOSAIC Expedition as a successful Arctic science diplomacy case.

MOSAIC Expedition as A Successful Arctic Science Diplomacy Case

Modeled after the historic Fram expedition of Nansen, the MOSAIC Expedition started with the departure of icebreaker Polarstern from Norway in 2019. Being the first year-round Arctic expedition with a budget of 140 Million €, the MOSAIC has become a prominent case for Arctic science diplomacy. Being conducted under the leadership of Alfred Wegener Institute (AWI), albeit the COVID-19 process, 442 scientists from 80 institutes and 20 countries attended the largest expedition. A total number of 600 people participated in the expedition which was supported by several icebreakers and aircrafts concordantly[5].

Since the central Arctic is considered as the epicentre of global warming, the main aim of the expedition is to understand climate processes and examine regional and global effects of climate change in the Arctic. Their findings pertaining to comprehensive observations of the sea ice, atmosphere, ecosystem, ocean, and biogeochemistry in the central Arctic over an annual cycle have updated the body of related literature. The whole data is also planned to become publicly available by 1 January 2023[6].

As a large-scale international and interdisciplinary consortium, the MOSAIC expedition will also enhance predictions related to short-term fluctuations as well as long-term trends[7] while enabling further cooperation between the East and the West. Therefore, it has initiated a new level of knowledge sophistication in which comprehensiveness that highlight the new approaches is admitted. The scientific community also plans to embark on a further journey to increase global awareness related to the current changes in the Arctic, enhance observational techniques, and advance knowledge production[8].

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Conclusion

In order to overcome persistent global challenges, governments are required to integrate science into both their domestic and foreign policy agendas. International scientific cooperation on polar research can be taken as a successful case to work across political barriers and form multilateral actions. The recent developments have highlighted an urgent need for locally embedded and community-relevant Arctic science. Although the resolutions at international levels are more complex, scientists are better equipped with different global initiatives owing to the considerable experience in science diplomacy and technological developments.

Since associated networks are essential for the effective implementation of science diplomacy strategy, developing an inclusive scientific governance framework including the emerging actors in the Arctic would provide substantial contributions to knowledge creation and problem-solving diplomacy. The MOSAIC expedition demonstrated that international scientific cooperation and knowledge production could be possible even under harsh conditions such as the pandemic. Challenges during the expedition, especially related to logistics, were addressed by multilateral institutions. Herein, the variety of the planned events and scientific projects under the auspices of the Russian Chairmanship may initiate a new age of collaboration between the East and the West. Consequently, Arctic science diplomacy can become the major tool for the unification of resilience efforts pertaining to the Arctic through fostering cooperative knowledge creation.

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Chapter 4
SCIENTIFIC INTERESTS OF NEW GENERATION

PRINCIPLES FOR DETERMINING THE CONTINENTAL SHELF IN THE ARCTIC OCEAN: ARCTIC STATES' SUBMISSION AND PROTECTING ISSUES

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The article discusses the issue of delimiting the Arctic Ocean by the Arctic states. It also explains concepts and principles by examples of the closed sea and half-enclosed sea, system 'mare nostrum', equity principle, 'uti possidetis' to clarify the principles of marine environmental policy for regions with freezing water bodies. The analysis addresses the balance of power in the Arctic and it discusses the emergence of new tensions between Russia and Norway in the Svalbard archipelago. The article aims to explain the most important principles of International Law through applied doctrine, offering itself as a valid vademecum for the introduction of Law of the Sea and Environmental Law studies.

Keywords: Arctic Ocean, delimitation approach, continental shelf determination, closed sea and half-enclosed sea, principle of equidistance, principle of equity, mare nostrum, uti possidetis, Svalbard.

Introduction

The Arctic Ocean is a part of the world ocean with freezing Arctic seas and their coastal parts with challenging climatic conditions. The specific of the Arctic Ocean is presented in Article 234 of the UN Convention on the Law of the Sea (UNCLOS)[1].

[1] United Nations Convention on the Law of the Sea (UNCLOS). 1982: official text: as of 10.12.1982. URL: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed: 15.01.2022).

The status of the Arctic Ocean is widely discussed by the Arctic five (Denmark, Norway, Canada, Russian Federation, and the United States). In 2008, the Ilullisat Declaration was adopted, securing Arctic coastal states' status for the Arctic countries. The issue of clarifying the external boundaries of the continental shelf of the Arctic Ocean by the Arctic states continues in the questions of determining the boundaries of the responsibility of the marine environmental policy. This article discusses several rationales, including objects and principles of environmental policy within the boundaries of the Arctic Ocean's freezing waters, and draws attention to the difficulties in the relationship of the Arctic states, such as, for example, Russia and Norway. To study the principles of marine environmental policy, around 30 legal documents, including 4 different International Conventions, 7 academic articles, 2 volumes, social media magazines, 2 governments statements, 5 state's submissions to the Commission on the Limits of the Continental Shelf (CLCS), International Court of Justice (ICJ) judgments, and a couple of research centres' studies, were analysed with the aim of their possible application in the distribution of the environmental policy of regions with freezing water bodies.

Delimitation Approach of the Arctic Ocean and Examples of the Objects' Protections

With the Ilulissat Declaration of 2008, the five states facing the Arctic Ocean have established the outer limits of the continental shelf, cooperating also to protect the marine environment and the right of free navigation[2]. In the same Declaration, the states have also committed themselves to respect international rules in the case of Arctic disputes. The appeal to the law of the sea in the Ilulissat statement allowed the application of the United Nations Convention on the Law of the Sea of 1982 to the Arctic region. In fact, the Ilulissat Declaration referred to the law of the sea as a whole (international, bilateral, and crystallized standards), including the United States (Alaska), which has not yet ratified the United Nations Convention of Law of the Sea (UNCLOS), adopted and signed in Montego Bay in 1982. The Montego Bay Convention does not explicitly mention the Arctic, but Article 234 includes legal exceptionalism by allowing coastal states to manage waters covered with ice that fall within exclusive economic zones (EEZs)[3].

[2] Ilulissat Declaration: official text: as of 28.05.2008. URL: https://cil.nus.edu.sg/wp-content/uploads/2017/07/2008-Ilulissat-Declaration.pdf (accessed: 15.01.2022).

[3] United Nations Convention on the Law of the Sea (UNCLOS). 1982. Article 234: official text: as of 10.12.1982. URL: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed: 15.01.2022).

Thanks to the new technologies, states can ensure and extend their sovereignty to the seabed and the continental margin. The continental margin includes the submerged extension of the earth's mass of the coastal state (bottom and subsoil of the platform) but not the high seabed[4]. It is an area where the coastal state has full rights and powers. The coastal States must define their external limits in accordance with Article 76 of the Convention, and they are not obliged to respect the limits of other states if they have been defined unilaterally or not under the rules laid down in the same article [Elferink, 2013].

The definition of the outer margin can extend beyond 200 miles until it reaches 350 miles, but the state should follow the complex procedure provided for in Article 76 of the same Convention and submit the request to the CLCS within a maximum of 10 years from its ratification [Byers, 2014]. In the case of developing countries, the committee may extend the time limit. In addition, the Commission had decided to grant more time to the states that had ratified the Convention before 1999, since the start of the 10-year tenure was set for May 29, 1999. Many states also decided to "suspend "The 10-year limit and only submit preliminary information about their continental extensions. As Øystein Jensen suggests, the Commission has repeatedly demonstrated a certain degree of flexibility in the application of the rules, and this circumstance has also created incongruities between the rules, as there are many regulatory discrepancies between Rules of Procedure (RoP) and UNCLOS. For example, Article 3 Annex I of the Rules of Procedure of the Commission on the Limits of the Continental Shelf (RoP[5]) grants a "partial submission" in the event of a territorial dispute with another coastal state (in line with Article 46 of the RoP) without that UNCLOS mentions this possibility [Busch, 2016].

State Responsibility in EEZ: Sovereignty Rights on Natural Resources

In International Law, the principle of State Responsibility means the set of obligations on the state that has committed the violation of rights and obligations. State responsibility was devised by the International Law Commission through the Draft Articles on Responsibility of States for Interna-

[4] United Nations Convention on the Law of the Sea (UNCLOS). 1982. Article 76.3: official text: as of 10.12.1982. URL: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed: 15.01.2022).

[5] Rules of Procedure of the Commission on the Limits of the Continental Shelf: official text as of 17.04.2008. URL: https://documents-dds-ny.un.org/doc/UNDOC/GEN/N08/309/23/PDF/N0830923.pdf?OpenElement (accessed: 15.01.2022).

tionally Wrongful Acts[6] in 2001 and is governed by customary principles. This responsibility has been proposed as a valid response to violations of rights in order to stop the offensive action and to avoid the repetition of the crime. This principle applied to Article 56 of the UNCLOS underlines the obligations of the coastal state to the conservation of the natural resources present in the EEZ. The coastal state has powers of exportation, exploitation, and conservation of natural resources in the air in which it exercises its territorial sovereignty[7].

The Montego Convention has defined the states' sovereignty lines, considering the different coastal conformations, the bays, the narrow, and the various areas on which to place their jurisdiction and interests. In EEZ the demarcation of the continental platform was the first to be regularized. In geology, the continental shelf is the demarcation line of a continent far from the perimetre of the coast. The platform normally ends at a point where the slope strongly increases its inclination. President Truman was the first to extend the rights to the seabed adjacent to the coast. From that proclamation, the states also began to define their maritime boundaries, and this practice soon became an "instantaneous" customary norm, a legal phenomenon that cannot create new norms but an unwritten law [Conforti, 2010].

As mentioned above, the delineation of boundaries requires specific legal and geological parametres. Therefore, this circumstance requires strong collaboration and cooperation, as well as the application of increasingly advanced technologies. In accordance with Article 76 UNCLOS, the five coastal Arctic states have started a long and detailed scientific analysis to support their proposals. For example, Canada proceeded to collect high-resolution seafloor images, geologists and geophysicists surveying, fare mapping submarine elevations, claiming the seabed under the North Pole[8]. Canada has overlapped submissions with Russia, which submitted a proposal to the Commission in 2001 and a partial submission in 2015 [Hossain, 2021]. The partial submission was supported by several technical and scientific procedures: deep seismic sounding, bathymetry survey, 120 sta-

[6] International Law Commission. *Draft Articles on Responsibility of States for Internationally Wrongful Acts*, November 2001, Supplement No. 10 (A/56/10), chp. IV. E. 1.: official text as of: November 2001. URL: https://www.refworld.org/docid/3ddb8f804.html (accessed: 15.01.2022).

[7] United Nations Convention on the Law of the Sea (UNCLOS). Article 56: official text as of: 10.12.1982 URL: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed: 15.01.2022).

[8] Government of Canada. 2019. Extending our outer limits: Canada's 2019 Arctic Ocean continental shelf submission to the United Nations: official text as of: 10.01.2022. URL: https://www.nrcan.gc.ca/simply-science/extending-our-outer-limits-canadas-2019-arctic-ocean-continental-shelf-submission-the/22165 (accessed: 15.01.2022).

tions of geological sampling[9]. Norway was the first country to get approved submission in the Arctic Ocean, the Barents Sea, and the Norwegian Sea by UN Commission, cooperating between research centres, universities, various agencies, and mapping authorities . Denmark worked on for Greenland, involving national geological survey (GEUS) with an acquisition, processing, and interpretation of seismic, bathymetric, and geological data together with other data acquired within the project or open file data from other sources[10].

State Responsibility in EEZ: Living — Resources Management

The responsibilities deriving from the management of EEZs do not fall only on not-living resources (for example, minerals or oil) but also on living ones. An example is fishing which, given the migratory activity, especially of some species, recalls the need for cooperation and shared agreements between contiguous or adjacent EEZs. According to Byers, Arctic fish species have not yet met market needs, but slow melting glaciers could make these products more accessible than ever before. For these reasons, fishing in waters usually covered by glaciers becomes a critical factor in Arctic governance.

Indeed, the adoption of regional fisheries agreements, especially for highly migrating stocks, could include non-Arctic states in decision-making processes and also countries that are not members of the Arctic Council. The European Union also said it was ready to collaborate, given its proximity to the waters of the North. The management of fishing in frozen waters is studded with these agreements. For example, in 1973, an agreement between Denmark (Greenland) and Canada was set to divide the fishing zones of the two states using a median or equidistance principle. The border measures about 1,500 nautical miles from Devis Strait and the Robeson Canal [Byers, 2014].

Conception of UTI Possidetis and Borders' Definition [Rossi, 2014]

The US and the Soviet Union entertained the first negotiations on the Bering Sea and the delimitation of the continental shelf over 200 nautical

[9] Federal authorities of Russia. 2015. Partial Revised Submission to CLCS: official text as of: 03.08.2015. URL: https://www.un.org/depts/los/clcs_new/submissions_files/rus01_rev15/2015_08_03_Exec_Summary_English.pdf (accessed: 15.01.2022).

[10] Government of Norway. 2006. Continental Shelf Submission of Norway in respect of areas in the Arctic Ocean, the Barents Sea and the Norwegian Sea: official text as of: 27.11.2006. URL: https://www.un.org/depts/los/clcs_new/submissions_files/nor06/nor_exec_sum.pdf(accessed: 15.01.2022).

miles in the Chukchi Sea[11]. These negotiations did not lead to any ratification because the equidistance method was not favorable to either side due to the presence of some islands. Between 2005 and 2010, there were agreements on the Svalbard archipelago and the famous Barents Treaty between Russia and Norway. Other claims concern the Beaufort Sea and the Lincoln Sea. As far as the Beaufort Sea is concerned, Canada affirms its sovereignty along the 141-stem meridian, based on three considerations: uti possidetis [Byers, 2013] (i. e., the theory of the sectors, according to which states cannot go over the lines beyond those established according to the criterion of equidistance), meridian method, resolution of the dispute by equity [Borgia, 2012]. Finally, in 2013, Canada submitted its proposals to the CLCS by submitting its requests based on three reasons:

- Scientific data: the effects of global warming and changes in the region[12];
- Institutional data: The Arctic Council and the IMO expressed their support for Canada[13];
- Comparative: Treaty of St Petersburg between Norway and the Russian Federation[14] [McDormal, 2003].

Uti possidetis is a concept that comes from Roman law that encourages sovereign rights over a specific area if this had already been subject to territorial delimitation in the past. The concept facilitates the new independent states to designate the new borders without entering into conflict. Uti possidetis was also recognized by the International Court of Justice (ICJ) in Burkina Faso / Mali frontier dispute, 1986. Furthermore, this concept avoids defining the areas as "terra nullius", land that cannot be claimed [Rothwell, 1996].

In 1973, Canada and Denmark agreed not to trace their borders across the northernmost point of Davis Strait, Baffin Bay, along the Robeson Chan-

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[11] Agreement between the United States of America and the Union of Soviet Socialist Republics on the maritime boundary: official text as of: 01.06.1990. URL: https://www.un.org/depts/los/LEGISLATIONANDTREATIES/PDFFILES/TREATIES/USA-RUS1990MB.PDF (accessed: 15.01.2022).

[12] Government of Canada. 2010. *Statement On Canada's Arctic Foreign Policy*: official text as of: 08.01.2022. URL: https://www.international.gc.ca/world-monde/assets/pdfs/canada_arctic_foreign_policy-eng.pdf, pp. 16–21. (accessed: 15.01.2022)

[13] Ibid, pp. 10–17.

[14] North American and Arctic Defence and Security Network. 2020. *Canada and the Maritime Arctic Boundaries, Shelves, and Waters* (eds) P. Whitney Lackenbauer, Suzanne Lalonde, and Elizabeth Riddell-Dixon. Canada. Official text as of: 08.01.2022. URL: https://www.naadsn.ca/wp-content/uploads/2020/03/CanadaMaritimeArctic-PWL-SL-ERD-2020.pdf p.X, pp. 5–13. (accessed: 15.01.2022).

nel. In 1977, Canada also delineated both fishing grounds in the Lincoln Sea, using the criterion of equidistance and the measurements planned for the coasts and points of the low tide line.

Only in the early 2000s, the CLCS accepted the first extension of the continental shelf beyond the 200 nautical miles proposed by Norway, which in 2006 defined its territorial sea for three separate areas in the northeastern Atlantic and the Arctic: the western basin of Nansen in the Arctic Ocean[15]; the Banana Hole and Loop Hole in the Barents Sea[16]. Norway was the second coastal state to make a request to the CLCS because the ratification of the Convention dates back to the Seventies, and the 10-year deadline for proposing delimitation was approaching. In 2009, Norway also asked for an opinion about the adjacent area around Bouvet Island and Queen Maud Land in Antarctica. For the second, Norway stated that it did not want to present any concrete action, as the dictates of the Antarctic Treaty still exist on that territory. For these reasons, the only Norwegian proposals analyzed were those in the Barents Sea during the 19th and 20th Sessions of the CLCS. As stated in Annex 2 of the RoP, Norway had to submit its proposals to the plenary session, including a summary of the scientific data (Annex 3 RoP). The result was quite positive for Norway, which received the recognition of the Nansen Basin, the delimitation of the outer boundary at East to the Loop Hole in the Barents Sea, and the recognition of the outer limit of the Banana Hole on West. Defining the boundaries of Loop Hole was definitely the most problematic since Russia had previously invoked that particular area of interest. Norway reminded the CLCS that under the Convention, CLCS recommendations in no case could adversely affect the territorial delimitation of neighboring states. The CLCS accepted the scientific data of Norway, establishing a fair division of the area (defined in accordance with Article 76 UNCLOS) and specifying that Loop Hole was a Norwegian and Russian EEZ and an aerial of fish interest for Svalbard.

Another option for defining borders is with inter-State agreements. These "boundary treaties" may also be temporary, pending the recommendations of the CLCS. These agreements follow the rules of international law, and the definition tools adopted are the criterion of equidistance and the theory of the sectors (mentioned above). State agreements can also temporarily resolve the overlapping situations of territorial claims. As explained

[15] The Yermark Plateau was recognized as a sloping foot on the continental margin. This circumstance also showed overlaps in the western part of Denmark (Greenland) and Norway (Svalbard).

[16] Government of Norway (2006). Continental Shelf Submission of Norway in respect of areas in the Arctic Ocean, the Barents Sea and the Norwegian Sea: official text as of: 27.11.2006. URL: https://www.un.org/depts/los/clcs_new/submissions_files/nor06/nor_exec_sum.pdf (accessed: 15.01.2022).

in the section on the CLCS procedures, the coastal state may also make a partial submission, leaving the negotiations of overlapping areas for the time needed to obtain the scientific data to be presented to the Commission.

New Tensions between Norway and Russia

Acceptance of the proposed claim from Norway by the CLCS can correspond to a shift in the balance of the Arctic Ocean. Thus, it can lead to a change in affairs with Russia, one of the active participants in submissions for determining the continental shelf. Subsequent issues that have arisen in the bilateral relations of states can be traced as the consequences. It is necessary to address the current state of affairs in the Arctic region between the countries.

To date, several difficult questions have accumulated regarding the provision of the Svalbard Treaty, which prohibits the use of the archipelago for "warlike purposes" (Article 9). During the Cold War, mainly coast guard ships came to Svalbard since Norway did not want to provoke the Soviet Union by the presence of warships here. Recently, however, the Norwegian naval frigate KNM Thor Heyerdahl has been sailing to Longyearbyen annually to emphasize the sovereignty of Norway at a time of heightened international tensions, which are also evident in the High North [Todorov, 2020].

In 2020, the Minister of Foreign Affairs of the Russian Federation for the 100th anniversary of the Treaty on Svalbard sent a message in which he expressed the illegality of Norway's establishment of the so-called fish protection zone, the unreasonable expansion of nature protection zones to limit economic activity in the archipelago, the deportation procedure adopted exclusively for Russian citizens on Spitsbergen, as well as limiting the use of the Russian helicopter. The Minister also proposed to conduct bilateral consultations to lift the restrictions from the operations of Russian organisations on the Archipelago[17]. To which the State Secretary of the MFA of Norway Audun Halvorsen in an interview has stated that Norway does not hold consultations with other countries regarding the implementation of its sovereignty over any part of Norwegian territory[18].

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[17] Press release on Minister of Foreign Affairs Sergey Lavrov's message to Norwegian Minister of Foreign Affairs Ine Eriksen Soreide on the occasion of the 100th anniversary of the Spitsbergen Treaty: official text as of: 15.01.2022. URL: https://norway.mid.ru/en/embassy/press-centre/news/press_release_on_foreign_minister_sergey_lavrov_s_message_to_norwegian_foreign_minister_ine_eriksen (accessed: 15.01.2022).

[18] Trellevik A. 2021. Norwegian MFA is Crystal Clear: Will Not Enter Into Dialogue with Russia About Norwegian Territory. High North News, 14 February 2021.

If the movement of naval forces is a natural part of the military discourse to solve, then the interpretation of the "dual-purpose" technologies becomes a rising problem in the Arctic. There is a discussion among states and experts about how modern "dual-purpose" space technologies deployed in Svalbard fit into the established 1920 framework. Possible decision envisages the creation of a multilateral mechanism for verifying the activities of states in the archipelago for its compliance with the provisions of the Treaty on the interpreted demilitarized status of Svalbard and the establishment of a regular dialogue between the countries concerned. In addition to the military issue, the archipelago also remains difficult to interpret the Paris Treaty concerning economic activity in the waters of Svalbard [Todorov, 2020].

Thus, such tension demonstrates the persistent level of misunderstanding between states and indicates the need for new agreements, for which it is necessary to recognize the existence of righteous dissatisfaction of one of the parties. Therefore, the state of affairs between Russia and Norway around the archipelago demonstrates that in the case of attempts to define territories arising contradiction presents an inability for the submissions of the Arctic states to acquire a complete look.

Arctic Seas: Definitions Closed Sea or Half-Enclosed Sea

As Rey L. considers the Arctic can be considered essentially like an enclosed ocean by the mainland, the applied legal regime is basically the law of the sea [Rey, 1982], so much so that the definition of the Arctic Sea as "closed sea" or "half-enclosed sea" is still unclear. An important definition is provided by UNCLOS, in Article 122 of Part IX, which says: "For the purposes of this Convention, "enclosed or semi-enclosed sea" means a gulf, basin or sea surrounded by two or more States and connected to another sea or the ocean by a narrow outlet or consisting entirely or primarily of the territorial seas and exclusive economic zones of two or more coastal States"[19]

Coastal Landscapes and the "Mare Nostrum" Legal System

Many authors have also thought about the "mare nostrum" legal system applied, for example, to the Mediterranean Sea. The principle of "mare nostrum" is another concept of Roman Law, which differs from "mare vastum"

URL: https://www.highnorthnews.com/en/norwegian-mfa-crystal-clear-will-not-enter-dialogue-russia-about-norwegian-territory (accessed: 15.01.2022).

[19] Article 122, United Nations Convention on the Law of the Sea (UNCLOS): official text: as of 10.12.1982. URL: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed: 15.01.2022).

("outer sea"), to be indicating the sovereignty of a marine area by Master of Sea, a coastal country. This doctrine has evolved, theorising the term "mare clausem", which we now call EEZ [Society for Underwater Technology, 1986].

According to Theutenber, the concept of Mare nostrum ("our sea") is not new in the Arctic. Ancient Norse laws and Icelandic "Gràgas" sagas already refer to the median line between two adjacent coasts. The adjective "nostrum" takes on a geographical meaning since, according to the knowledge of the time, the Mare Septentrionali, the Northern Sea, was "closed" between the shores [Theutenber, 1984].One example was Greenland which was assumed to continue into the Americas. The concept of mare clausum in the Arctic was mostly successful in medieval times when the great European powers began to have an interest in the Arctic Sea [Theutenber, 1984].

Leanza considers the legal system of "mare nostrum" as a kind of "regionalism" and "cooperation", in which all coastal states accept the responsibility to observe obligations and duties in the protection of the marine environment [Leanza, 2008]. Another feature of the Arctic Ocean or arctic seas can be the presence of ice-packs, but they do not change the definition of marine spaces. Ice-covered sea and ice-packs do not fall on specific legal treatment. UNCLOS does not include any particular specific on this issue [Joyner, 1991].

On the contrary, ice-shelves are considered mainland, often causing problems in fixing the baseline. Ice-shelves, such as coastal landscapes, change rapidly (especially for climate change) and are therefore calculated based on the average annual ice shift.

Criterion of Equidistance

Previously, the Geneva Convention solved the territorial controversies by the criterion of equidistance. The criterion of equidistance means drawing a line whose points are equidistant from the respective baselines of the territorial sea[20]. However, in 1969, the International Court of Justice ruled that the criterion of equidistance was not imposed by customary law and states could make agreement but ever on principle of equity. However, this solution was fallacious, as the agreements, as contracts, can remain valid even for formal defects (being de facto unfair, but valid).

Therefore, the Montego Bay Convention, referring to the "principle of equity", merely indicates practical and non-binding criteria that have a mere

[20] Article 15, United Nations Convention on the Law of the Sea (UNCLOS): official text: as of 10.12.1982. URL: https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed: 15.01.2022).

corrective character of the criterion of equidistance (to be considered a basic criterion). In seeking fair principles based on international law of uncertain existence, international judges and arbitrators have considerable discretion, accentuated by the diversity of circumstances that makes every delimitation a single case. For example, in many cases, the jurisprudence has given a small value to the presence of the islands because in some cases the continental shelf of one state has decreased in comparison with others (as in the judgments of the International Court of Justice "Tunisia vs. Libya 1982").

Equity and Equitable Principles

The definition tools used were the criterion of equidistance and the principle of equity [Borgia, 2012]. The principle of equidistance is based on equity criterion. In law, the concept of equity has several meanings. Equity can refer to the principle of balancing opposing relevant interests according to social conscience (also called "fairness"). In purchased law, it can also refer to that branch of the Common Law type of jurisprudence, in which justice goes beyond the written law and refers to the judge at its own discretion. In international law it is a criterion for the solution of international disputes adopted by the International Court of Justice if the parties to the dispute so request [Bello, 1980].

In 1980 two agreements established two fishing zones and the border between Jan Mayen (Norway) and Iceland. In 1995, Denmark (Greenland) and Norway (Jan Mayen) agreed upon the ruling of the International Court of Justice for Norwegian sovereignty over the territory, while in 1997 the Danish Crown also defined the fishing zones with Iceland around the Kolbeinsey Island. Kolbeinsey is a small island, and it is facing erosion pretty fast, which is not going to be better considering the expected climate change effects. This island plays a considerable role in Icelandic geopolitics since it is the only Icelandic Arctic extension. Once the island is completely disappeared, it is probable that Iceland will be called to negotiate its borders again.

Conclusion

On the example of the submissions of the Arctic states, it can be said that within the boundaries of the freezing waters of the Arctic Ocean and defining the continental shelf, the five Arctic coastal states promoted the development of the doctrine of the Law of the Sea. In the last 20 years that have followed the establishment of UNCLOS, the five Arctic states have attached various principles to their proposals, which have thus contributed to a new constellation of values at the basis of Environmental law and the

protection of the marine environment. Despite the tensions, it is possible to define these principles according to the approach adopted by the individual states.

In 2009, Denmark conducted a long-time mapping of the Arctic Ocean seabed to include the North Pole in its own continental shelf, creating new doubts and expectations about these demands should Greenland gain total independence in the future. Norway and Russia have been cooperating on a bilateral agreement in sharing the Bering Sea, and the Norwegian Government has already obtained its submission accepted in the Arctic Ocean. The countries are considering their areas of responsibility issues of fishing, issues of conducting scientific and economic activities in Svalbard based on scientific data. However, the presented state of affairs has shown that arising contradiction on the subject of an established contractual basis of Svalbard presents an inability for the submissions and the state of the Arctic to acquire a complete look. The United States has pioneered the consideration of offshore platforms as objects of special attention; Canada elaborated its positions on three levels, focusing both on geological data and in line with the other Arctic states' revindications.

The concepts of mare nostrum, uti possitedis and equidistance with principles of equity and fairness were presented for application in the environmental policy of regions with freezing water bodies.

Thus, it is evident that a legal system composed of hard law and soft law instruments is a living multilevel and regionalist legal model that corresponds to the current priorities and demands of the Arctic states. It is hoped that this legal model will lead to greater attention to the marine environment, above all the living resources of the Arctic Sea.

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SCIENCE IN DIPLOMACY

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The article aims to review literature presented on the subject of science diplomacy. Before the review of paper itself, there is a number of key definitions presented that are necessary for clear understanding of the concept and avoiding any ambiguity. In addition to terminology the author gives examples of international scientific organisations related to shaping science diplomacy dimension, among those are the International Science Council, the AAAS and the Royal Society. There are two basic criteria set for selecting works on the subject of matter: presence of primary original ideas and presence of terminology devoted to science diplomacy. Selected papers contain taxonomy of science diplomacy dimension and are seen as a key works in this field of studies. These works are report by the Royal Society "New Frontiers in Science Diplomacy (2010), an article by P. D. Gluckman, V. Turekian, R. W. Grimes, and T. Kishi "Science Diplomacy: A Pragmatic Perspective from the Inside" (2017), a book by Pierre-Bruno Ruffini "Science and Diplomacy A New Dimension of International Relations" (2017) and his critical review of the conceptual framework (2020).

Keywords: science diplomacy, scientific research, international scientific cooperation, international scientific organisations, science in diplomacy.

Diplomacy is a highly diverse activity that implies economic, humanitarian, political and other types of state interaction. Nowadays, science is actively attracted into the realm of diplomacy. The review of literature devoted to the role of science in diplomacy is conducted with a goal to identify a state of the research object which is science diplomacy.

Relevance of studying science diplomacy is explained in a range of trends existing in contemporary fields of science and diplomacy in general, as well as global trends impacting on interstate relations. First of all, scientific researches have become highly internationalized that introduced scientists deep into realm of international relations and created dependence of science and diplomacy, especially if we are talking about scientific technical cooperation which is highly controlled by states. Here, we also need to mention that contemporary scientific technological developments are extremely expensive and demand cooperation of scientific specialists from different countries which meets state interests. Furthermore, a number of international scientific organisations have appeared and they need to be studied.

As for global trends, global challenges pose a significant threat for humanity and demand collective actions and comprehensive scientific assistance for coping with them. Among those challenges we can highlight

climate change and issue of nuclear weapon as the most pressing ones due to high risk posed for human existence. All these facts make scientific participation in diplomatic sphere an inalienable factor of contemporary international relations development.

Within the work we are going to give definitions to the key terms we are using in our study in order to avoid any ambiguity and make our work as precise as possible. The next step is to present scientific organisations related to scientific cooperation and diplomatic activity. And, finally, we will list works devoted to the subject of matter.

To begin with, it is essential to have clear understanding of all terms in order to have successful articulation about the subject. As we are going to speak about science diplomacy we need to understand that 'diplomacy' is a field of state interaction. Russian 'Big legal dictionary' provides us with a following definition of diplomacy: "one of the ways to implement the foreign policy of the state. It is carried out in the form of official knowledge about the structure and behavior of the natural and physical world, based on facts that you can prove, for example by experiments directly by diplomats, contributing to the achievement of the goals and objectives of foreign policy and the protection of the interests of their state and their citizens abroad"[1]. On-line Oxford Dictionary offers a shorter definition of the term: "the activity of managing relations between different countries"[2].

Another key component of our study is science, which is defined by Ozhegov's Explanatory Dictionary as "a system of knowledge about the laws of nature, society and thinking development, as well as a separate branch of those knowledge" (1999)[3]. On-line Oxford Dictionary gives a lookalike definition: knowledge about the structure and behavior of the natural and physical world, based on facts that you can prove, for example by experiments[4].

International scientific cooperation also plays an essential part in conducting our study. One of the definitions that can be found in Russian Sociological Encyclopedia is a direction of foreign policy, the subject of which is cooperation between states in conducting joint research or development,

[1] Diplomacy. *Large Encyclopedic Dictionary. Bolshoj ensiclopediceskij slovar.* Sukharev, A., Krutskikh, A. and Sukhareva, A. (eds). 2003 URL: https://dic.academic.ru/dic.nsf/lower/14406 (accessed: 21.10.2021). (In Russian)

[2] Diplomacy. *The Oxford Advanced Learner's Dictionary* URL: https://www.oxfordlearnersdictionaries.com/definition/english/diplomacy?q=diplomacy (accessed: 21.10.2021).

[3] Science. *Explanatory Dictionary.* Ozhegov I., Shvedova (eds) 1949–1992. URL: https://dic.academic.ru/dic.nsf/ogegova/120534 (accessed: 21.10.2021). (In Russian)

[4] Science. *Oxford Advanced Learner's Dictionary.* URL: https://www.oxfordlearnersdictionaries.com/definition/english/science?q=science (accessed: 21.10.2021).

as well as in regulating relations that spontaneously develop between different national scientific communities (personnel migration, information exchange)[5]. Here we need to mention also that international scientific cooperation is not only a direction of foreign policy but also can be developed by some organisations or individuals apart from a state.

One of scientific cooperation type is scientific technical cooperation. Big Encyclopedic Dictionary defines is as a form of international economic cooperation[6]. However, this definition does not provide full picture of the scientific technical cooperation complexity. "Concept of scientific technical cooperation of the Russian Federation" offers a more comprehensive definitions: a set of joint activities, works, relationships and forms of interaction of the cooperating parties in various fields of science, technology and innovations in order to obtain new knowledge, develop technologies, as well as create and improve new products as a result of intellectual activity for national needs or implementation on the world market[7].

The key unit of our study is a scientific research that is seen as an element of science diplomatic realm. In Russian language this unit can be referred as "научно-исследовательская работа" which can be translated literally as "scientific research" or "research" shortly. The word "работа" in this phrase can mean both activity or scientific paper according to context. Besides this, Russian papers also can contain such lookalike term as "научно-исследовательская деятельность", which also defines research but only as an activity, as well as "научная деятельность" that has the same meaning as all above mentioned ones. All above mentioned terms used for description of scientific research in Russian language can be equally used in the text with a slight difference that depends on the context.

As for defining scientific research, among Russian key documents Russian Federal law "About Science and Scientific Technical policy" can be referred to. It uses "научно-исследовательская деятельность" for scientific research activity and defines it as an activity aimed to gain and apply new knowledge. Furthermore, within the scientific research activity the law distinguishes fundamental, applied and exploratory scientific research. Fundamental research is an experimental or theoretical activity aimed at gaining

[5] International Scientific Cooperation. *Russian Sociological Encyclopedia*. Osipov, G. V (ed). 1999 (In Russian). URL: https://sociologicheskaya.academic.ru/1057/сотрудничество_международное_научное (accessed: 21.10.2021).

[6] Scientific Technical Cooperation. *Large Encyclopedic Dictionary.* 2000. URL: https://dic.academic.ru/dic.nsf/enc3p/209246 (accessed: 21.10.2021). (In Russian)

[7] Concept of international scientific technological cooperation of the Russian Federation: official text: as of 8 February 2019. URL: https://minobrnauki.gov.ru/upload/2021/07/kontseptsiya_MNTS_Rossiyskoy_Federatsii.pdf (accessed: 21.10.2021).

new knowledge about basic laws of structure, functioning and development of man, society, and the environment. Applied research implies an application of new knowledge for achieving practical goals and solution of certain tasks. And, finally, exploratory research is a research aimed at obtaining new knowledge for the purpose of its subsequent practical application and carried out by performing research work. The law also pays attention to scientific technical activity which is an activity aimed to gain, apply new knowledge for solution of technological, engineering, economic, social, humanitarian and other problems, to ensure functioning of science, technique and production as a single system[8].

If we refer to foreign dictionaries such as Oxford or Cambridge, here we do not find "scientific research" or "scientific research activity" but only "research" which is defined as a careful study of a subject, especially in order to discover new facts or information about it. However, we can see in the dictionary that "research" is more often used in collocation with an adjective "scientific"[9]. To sum up this part about using the key unit of our study we can make an inference that "scientific research activity" is more often used for referring to process, whereas, "research" or "scientific research" are more general terms which can be used to describe process as well.

Finally, here we also should list "science diplomacy" which is often referred in speculation about science and diplomacy interaction. We will come to this term later as several researches selected for the review consider it as a subject matter.

Moving to another part of our review, there is a number of organisations appeared in sphere of scientific cooperation which serve to promote cooperation among scientists and its results. Among them we can name such global organisation as the International Scientific Council. The ISC was launched in 2018 following a merger of the International Council for Science (ICSU), which was created in 1931, and the International Social Science Council (ISSC), created in 1952. The Council is committed to supporting the development of all science, from discovery to application, and including the full range of disciplines, from the natural and social sciences to the behavioural, data and technological sciences[10].

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[8] About science and state scientific technical policy see official text: as of 23 August 1996. URL: http://www.consultant.ru/document/cons_doc_LAW_11507/c0a49fc869aeeb5b28ca88d3d37b7d8f7474375f/ (accessed: 21.10.2021). (In Russian)

[9] Definition of research noun. *The Oxford Advanced Learner's Dictionary.* URL: https://www.oxfordlearnersdictionaries.com/definition/english/research_1?q=research (accessed: 21.10.2021).

[10] ISC Broshure-2019. URL: https://council.science/wp-content/uploads/2019/04/ISC-Brochure-2019.pdf (accessed: 21.10.2021).

Another scientific organisation, that plays its part in development of science and studies about intersection of science and diplomacy, is The Royal Society located in the United Kingdom. The society has a long history that starts with 'invisible college' of natural philosophers and physicians back in 1660 and contains such widely known names as Benjamine Franklin, Albert Einstein and Stephen Hawking. The main purpose of the Royal Society is to recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity[11].

In terms of our research, in 2010 the Society published a report devoted to science diplomacy which is considered as one of the central pillar for studying science and diplomacy interaction. The report is based on two days meeting "New Frontiers in Science Diplomacy" held in 2009, London, organised by the Royal Society and the American Association for Advancement of Science. As there was a range of representatives form Muslim and Western countries the subtext of using science for reducing tensions between parties appears[12]. During the conference scientists from twenty countries listened to a range of reports and discussed issues devoted to science diplomacy. Among those numerous topics we can highlight directions and perspectives of science diplomacy, as well as the role of science diplomacy in such issues as environmental security and international spaces[13]. Speakers from various countries were presented, some of them are Italy, India, Brazil, the UK, the USA, whereas, Russian researchers did not presented any analyses. This can be explained as Russia did not seek to reveal its intentions and plans for science as it is an essential part of state development.

The American Association for Advancement of Science or the AAAS which has been mentioned above is another scientific organisation that seeks to promote scientific achievements among countries. As the web-site claims, it is the largest multidisciplinary scientific society and publishing organisation that has its own family of journals. The AAAS counts members from more that 91 country around the world and has quite long history that starts in 1848 when the scientific community of America started to form[14].

In terms of our studies the AAAS is significant not only because it is related to the meeting "New Frontiers in Science and Diplomacy" but also

[11] Mission and priorities. The Royal Society official website. URL: https://proxy.library.spbu.ru:2822/about-us/mission-priorities/ (accessed: 21.10.2021).

[12] Mission and history. The AAAS website. URL: https://www.aaas.org/mission (accessed: 21.10.2021).

[13] New frontiers in science diplomacy. The Royal Society&the AAAS report: official text: as of January 2010. URL: https://royalsociety.org/~/media/royal_society_content/policy/publications/2010/4294969468.pdf (accessed: 21.10.2021).

[14] Mission and history. The AAAS website. URL: https://www.aaas.org/mission (accessed: 21.10.2021).

because of the journal it publishes. The journal "Science&Diplomacy", which is in open access for everyone, gathers articles about nexus of science and diplomacy. As it is said on its official web-site the journal provides a forum for rigorous thought, analysis, and insight to serve stakeholders who develop, implement, or teach all aspects of science and diplomacy[15]. A quick look at recent publications allows us to make an inference that "Science&Diplomacy" is a platform for both practitioners and scientists. Besides, there is a variety of scientists from different fields, not only political sciences. In terms of Covid-19, there is a number of publications made by virologists and other specialists related to health.

Moving to literature review itself and science diplomacy term, science diplomacy is a relatively new dimension of contemporary diplomacy that has its manifestations back in history but finds its rapid rise in the 21st century.

Studies devoted to science and diplomacy and science diplomacy are numerous. We have set two basic criteria for selecting key works for our literature review. The first one is a presence of primary original ideas in the work. There are plenty of various studies devoted to scientific diplomacy, however, many of them refer to earlier studies or primary sources. Thus, it is essential for us to find primary sources to recreate discourse available about science diplomacy. Another criterion is presence of terminology devoted to science diplomacy that includes such key words as "scientific research", "scientific research activity", "science diplomacy", "scientific technological cooperation", "scientific cooperation". This aspect is important for primary stage of our research where we pay attention to our terminological apparatus in order to be precise and avoid any ambiguity while developing our study.

General picture of studies on science in diplomacy, as a rule, is quite fragmented as works published on the subject matter are restricted with considering certain states or geographical area where science diplomacy implemented. Among those we can find numerous works about the USA, Europe and their science diplomacy strategies and scientific cooperation. Besides, there are a range of works that analyse the role of science in the context of a certain global issue like health challenge, climate or resource policy.

However, among those fragmented studies there are several key works within which an attempt to develop general knowledge about science diplomacy was taken and which are considered as central pillars on the subject. These researches provide theory of science diplomacy with a conceptual framework. Among those are the above mentioned report "New Frontiers

[15] About the journal *Science&Diplomacy* see URL: https://www.sciencediplomacy.org/about (accessed: 21.10.2021).

in Science Diplomacy" of the Royal Society published in 2010[16], an article by P. Gluckman, V. Turekian, R. Grimes, and T. Kishi "Science Diplomacy: A Pragmatic Perspective from the Inside" [Gluckman et al., 2017] which was published in a reviewed earlier "Science&Diplomacy", a book by Pierre-Bruno Ruffini "Science and Diplomacy A New Dimension of International Relations" [Ruffini, 2017] and his critical review of the conceptual framework [Ruffini, 2020].

Looking closer at chosen studies, let us start with the one of earliest publications which is the Royal Society report "New Frontiers in Science Diplomacy", 2010[17]. As it has been mentioned earlier the Royal Society's report is based on the materials of two days meeting in London. It represents a quite successful for that moment attempt to determine the role of science in diplomacy and science diplomacy as a dimension. The main achievement of the paper is distinguishing of three science diplomacy dimensions: science in diplomacy, diplomacy for science and science for diplomacy. Those three dimensions became popular among researches and are often referred to nowadays although more than ten years passed after the publication of the report. It considers those dimensions in details with further examples and case studies on popular issues placed on the intersection of science and diplomacy, which are governing international space and fight with global challenges.

Another key work is "Science Diplomacy: A Pragmatic Perspective from the Inside" by Peter D. Gluckman, Vaughan C. Turekian, Robin W. Grimes, and Teruo Kishi which was published in the journal "Science&Diplomacy" in 2017 [Gluckman et al., 2017]. The authors are practitioners from the sphere of science diplomacy and current or former science or science and technology advisers in different states. The article claims that although the Royal Society's report taxonomy is useful, it is not comprehensive and in some sense is already outdated. So, it offers alternative framing with new categories for science diplomacy based on the attempt to answer the question why countries might invest efforts and resources in science diplomacy and international cooperation. These categories are actions designed to directly advance a country's national needs, actions designed to address cross-border interests, actions primarily designed to meet global needs and challenges. The work has practical value as the authors attempt to distinguish factors or advises for successful science chief advisers in foreign ministries.

[16] New frontiers in science diplomacy. The Royal Society&the AAAS report: official text: as of January 2010 https://royalsociety.org/~/media/royal_society_content/policy/publications/2010/4294969468.pdf (accessed: 21.10.2021).

[17] Ibid.

Among those, such essential factors as well established communication of the process parties and experience of the advisor can be highlighted.

Our next author is Pierre-Bruno Ruffini who is also related to science diplomacy practice as he has been serving as a science adviser for six years. He published a book "Science Diplomacy: A New Dimension of International Relations" [Ruffini, 2017]. The author provides us with a profound consideration of science diplomacy from different perspectives. In the beginning the book offers historical retrospective on the dimension's development where our attention is drawn to the example of the Cold war relations between the Soviet Union and the USA when science played the role of a bridge. In general, the book seeks to find a definition that can perfectly suit science diplomacy phenomena. For better understanding, we are given a range of examples how science diplomacy is exercised by various states and what institutions are created for implementation of science diplomacy. The list of states the author analysed includes major European states among which are Switzerland, France, the UK, Italy and Germany, developed non-European states including Japan, Canada and the USA, and, finally, specifically distinguished but not characterized as previous ones, China, India and Russia, which the author presumes as developing non-European states. The author pays special attention to the dimension of multilateral science diplomacy and considers it as one that has a perspective and necessity to develop. The idea is based on the argument of fighting global challenges where climate change has the prominent example of institutional framework — Intergovernmental Panel on Climate Change. All in all, the work presents a substantial analysis with a good illustrations from practice.

Another work by Pierre-Bruno Ruffini that represents a certain value for our research is "Conceptualizing science diplomacy in the practitioner-driven literature: a critical review" [Ruffini, 2020]. The work contains an impressive massive of literature and sources useful for beginners who start discovering science and diplomacy intersection and science diplomacy as a phenomena. After revising the work one question arises which we suppose the author wants us to think of: where does science diplomacy end and politicization of science starts?

Summing up, the review of the conceptual framework, institutions operating in the intersection of science and diplomacy and works devoted to the topic allows us to make following inference. First of all, most of the publications on the subject of science diplomacy are created by practitioners who mainly represent scientific society rather than current or former diplomats who represent state interest on the global arena. Due to this, papers contain an optimistic and in some sense idealistic view on the subject where science plays a role of a bridge in interstate relations or the role of a saviour

that can help governments to save the world and fight the global challenges. However, the reality is not as utopian as scientists would like it to be, so science more often plays a role of instruments in achieving state interests which are rather lucrative.

The second inference is that states should pay more attention to the role of science in diplomatic realm and facilitate further institutionalization of science diplomacy in order to create an effective mechanism of communication between diplomacy and science, as well as between global scientific community and local bodies responsible for science diplomacy.

Finally, science diplomacy is a concept that appeared in the beginning of the century and was introduced by representatives of social sciences, but have already tightly entered the realm of international relations studies. Numerous works considered for our review use the concept of science diplomacy for speculating about scientific interactions with an element of state diplomacy and diplomatic interactions with an element of science.

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THE ADVENTURES OF JACK LONDON IN THE ARCTIC

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This article examines the origin of the Arctic image in Jack London's works. To this date, this aspect of the writer's work remains to be less studied than the others. The authors attempt to analyse the biography of the writer and some problems stated in his works. Today the Arctic issue is becoming one of the central elements of the international political discourse. Researchers also view the region through the prism of solving environmental problems. At the same time, the world academic community is extremely interested in continuing the historical and cultural studies of the region. Taking it into account, the authors aim to assess the writer's contribution to the development of the world fiction. The main goal of this work is to give an answer to the question: what exactly makes the image of the Arctic in the works of Jack London so vivid, unique and substantial?

Keywords: Klondike, Alaska, Yukon, gold rush, short stories.

Introduction

Jack London is an indicative writer of the late 19th and early 20th century. His works received critics' and readers' recognition throughout the world. One of the most important aspects of his creative work is the unique Arctic image portrayed in its fullness and in a multifaceted way. Today the Arctic issue is becoming a central element in the international political discourse. Researchers also regard this region through the prism of solving ecological problems. Alongside with that, the global academic community is extremely interested in continuing the historical and cultural studies of the region. It should be noted that the literary phenomenon of the Arctic image in Jack London's world might remain the least studied part of his creation and goes far beyond the accustomed perception of the visual environment in the artistic work.

Method

J. London's biographies were used in the article to scrutinise the events of the writer's travel to Alaska. They were written by Forner P., Garst S., Afanasyev G., Zverev A., Mikhailov K., and etc.

Results

We have selected and placed the most interesting and meaningful adventures of Jack London in the Arctic below. They influenced the writer's

further career to a large extent. Having prepared independently and passed exams successfully, Jack London entered the University of California but after the 3rd term, he had to leave because of the tuition fees lack. In that spring of 1897, Jack London decided to depart to Alaska [Afanasyev, 1978]. The desire to find gold and occupy a potentially profitable plot of the uncultivated land became his main motivation. At that moment the young writer did not suspect that in the North, he would discover something that is more meaningful. He was only 21 years old.

In June 1897, he had just quitted the laundry when the steamboat "Portland" moored in Seattle and so did "Excelsior" in San Francisco. The miners who were on-board brought 3 tonnes of gold from far North-West of Canada. Newspapers had instantly spread the information and provoked the large-scaled gold rush in history.

Jack London was full of decisiveness to join them but he was unable to raise money on transportation and supplies. James Shepard who was 60-year-old family member mortgaged his wife's house to finance the trip and invited Jack as he saw his will and ability to cope with difficulties. These qualities were the must in the extreme conditions of that difficult expedition [Bykov, 1973]. They bought fur coats, headwear, high heavy boots, thick gloves, tents, blankets, axes, mountain equipment, metal cooker, the instruments for building boats and cabins as well as the annual food storage. Thus, Jack London being a beginning writer with the unfinished education and ambitions departed to conquer the eternally cold lands of Alaska. They sailed to Alaska on-board together with other gold finders among which they found three partners. Having landed in Juneau, they hired Tlingit canoes and climbed the 100-mile fiord to Dyea where notorious Chilkoot Trail started.

To reach Klondike, they needed to go through the coastal range of Alaska with all stores. The path was too steep for horses and bat-mules. They sent 3000 pound of supplies to the top by Tlingit porters. The price was 22 cent per one pound. The rest of them was being carried on their backs. Some sources assert that Jack had born about one tonne that was very high indication [Bykov, 1973, p. 167]. The road was uneven and dirty. Some of its parts were covered with swamps. They had to cross a ruffling river with the help of cut trees. "It is very difficult to walk on them. The water streams underneath and 100 pound is on the back", Thompson [one of the partners] noted in his diary [Cain, 2013, p. 123]. The people were buried in shallow tombs near the path.

In August 21st they reached so called "Sheep Camp" with their feet covered with blisters. More than a thousand of gold finders crowded in the dirty camp city. It was the last part of the plateau before climbing frightening Chilkoot Trail.

Photographer Frank La Roshe took a picture of the gold rush for the United States Geological Survey. He gathered 24 people and took a snapshot of them standing in the dirt in the background of the glacier. All of them looked sternly and solemnly, including young Jack London with the forelock seen below the cap and the hand put in the pocket. It is the only famous photo of him in the Far North.

In September 24th, the group sailed the boats in the tributary *Sixsty Mile* of the Yukon-River. Next day in Box Canyon, the river was converted into the roaring and foaming ditch that pendled the team to make a tough decision. Many boats crashed in those rapids. In this connection, many gold finders started carrying their boats and supplies around them that took 4 days in total. As a result of the general voting, Jack's group decided to economise the needed time and sail through rapids.

27-pound boat was fully loaded with supplies. Jack was maneuvering with a row while they were sailing swiftly through the icy water. At that time, the others were desperately rowing to avoid a crash against the rocks. The current was so fast that they had overcome the canyon of one-mile length for 2 minutes having avoided any damages apart from one broken row [Forner, 1947]. That event had become the first real test for Jack London's character and had a heavy impact on his future creative work.

The group faced more dangerous situation in Wight horse Rapids where vertical waves were enveloping rough stones forming whirlpools. Jack's mastership helped them to overcome the obstacle successfully once again. Then he returned bravely and helped a young couple to sail the boat through the same rapids. Thompson wrote in his diary that, in that evening, the whole group experienced the unbelievable self-confidence due to the young writer's spirit in many respects [Garst, 1945].

The Yukon is the third largest river in North America after the Mississippi and the Mackenzie. It is usually frozen by the mid-October. In October 9th, they decided to stop approximately 80 miles from Dawson City and spend the winter in the estuary of the Stewart River where they had been lucky to come across several huts. Jack London sailed the boat downwards the river to apply for mining operations in Dawson City. Having been founded the year before, Dawson City consisted of more than 5000 residents living in the huts, tents, and shanties. At that moment, in the city, the problem of hunger aggravated and muddy streets were filled with the unemployed and huskies.

In December 1897, in the coldest and darkest season, Jack left Dawson and skied 80 miles in snowshoes on the frozen Yukon River. London's remembrances and weather diary pointed to the temperature that was close to –40 °C. Having achieved the Stewart River, he joined his three partners

in one of the found log cabins. Later the writer would recall that even when a metal stove was made read-hot, meat remained frozen in 8-foot distance from it.

They ate sourdough bread, beans, and bacon with game. Melting the frozen earth with the fire, they dag gold. Unfortunately, they managed to find a very small amount of metal.

Friends appreciated Jack's company, as he was an excellent interlocutor and storyteller. He was cheerful, generous, and brave. In that winter, almost all men on the Stewart River had become prototypes. It is impossible to overestimate the influence of the memories about that severe Arctic winter on the writer's retrospective. The extreme North environment had become not only a discovery but also a completely new, unknown source of creativity for Jack London. Finally, all group members got Barlow's disease owing to the lack of fresh vegetables, vitamins, and sunlight. The illness killed many gold-diggers in Klondike and ended Jack London's short career as a miner.

When Jack London had returned to San Francisco in 1898, he was recovering from Barlow's disease slowly. Then he started writing articles, essays, poems, and short stories. He had submerged into work completely: he had been spending for 16 hours a day at the desk and had been reading a lot trying to understand formulae of the commercial success [Petrov, 1989]. At last, the journal "Overland Monthly"offered to publish a short story about Klondike called "To the Man on Trail" if he was satisfied with the modest payment of 5 dollars. Jack agreed and in January 1899 his first literary work was publicised [Zverev, 1993]. Immediately after that, he began to gain popularity among the American readers. J. London succeeded in selling "An Odyssey of the North" to the publishing house "Atlantic" for 120 dollars. After that, his career started developing rapidly. It was the Golden Age of the American journalism: editors were looking for the bright futuristic brief fiction and Jack London mastered that conception through the heavy labour, persistence, trial-and-error method. Having left Alaska, he became the highest paid writer of short stories in America 2 years later. Jack London had become famous as "American Kipling" by 24 years old.

The idea of "The Call of the Wild" that is the 7th collection of short stories and perhaps his best book came to his mind in 1903 after his work as a journalist in the slums of London's East End. He recalled the untouched wilderness of Yukon, the Northern Lights, and teems of dogs rushing on the snow in –50 °C con amore. He intended initially to write a short story of 4000 words devoted to a dog but he (as he said later: "An idea outperformed me"), wrote more than 30 000 words before ending.

He had written it for a month being in the state of creative rush. Then he sent the manuscript to George Platt Brett, the head of "Macmillan Pub-

lishing", who acknowledged it as a chef-d'œuvre and made one of the most profitable deal in the company history with the young writer. He offered 2000 dollars for the full rights [Mikhailov, 1983]. Jack needed money so he agreed. The book having become a bestseller immediately was issued thought the world afterwards.

More than 80 novels and short stories had been born in the Far North and had been composed for 9 months, which he had spent there [Lunina, 1996, p. 67]. The memory of Alaska and difficulties, which his friends and he had to encounter, continued to inspire him.

Conclusion

The Arctic is not only the object of the literary creation for Jack London. This is the place where the writer spent an utterly meaningful part of his life. The Arctic, its nature and people whom he had met in the North influenced greatly the shaping of his views and outlook. Thus, the writer's publicistic legacy represents his life story directly.

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VOLUNTARY AND COMPULSORY INSURANCE IN THE SUBJECTS OF THE ARCTIC ZONE OF THE RUSSIAN FEDERATION (2016–2020)

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The aim of the study is to determine the dynamics and direction of insurance development in the land territories of the Arctic zone of the Russian Federation for the period 2016–2020, in terms of types of insurance and constituent entities of the Russian Federation: Murmansk region, Nenets Autonomous Okrug, Chukotka Autonomous Okrug, Yamalo-Nenets Autonomous Okrug. The article analyzes the statistical data, the development of voluntary and compulsory types of insurance over a five-year period, determines the main types of insurance in the constituent entities of the Russian Federation and draws conclusions about further prospects for the development of insurance, directly related to the development of the Arctic zone.

Keywords: voluntary insurance, compulsory insurance, Arctic.

Insurance market is the most important component of the modern economy and is a special financial mechanism that occupies the niche of a system-forming and socially significant link within the national economic system [Romanova, 2021]. The development rate of the insurance industry is directly related to the development of economic well-being of individual subjects as well as the state, and determines the functions of stabilizing the social system as a whole.

The Arctic is a unique region that has increasingly attracted attention of the North Pacific states in recent years. Its growing potential in economy, transportation and logistics forms a solid foundation for international cooperation. All over the world scientists and experts are analyzing the richest natural potential of the seas and subsoil and the possibilities of using the Northern Sea Route[1]. The relevance of the study is due to the continuing interest of researchers in the study of the Arctic zone's secrets. The article analyzes the statistical data on premium collection in the context of types of insurance and constituent entities of the Russian Federation. It also draws conclusions about the need for insurance protection and the dynamics of insurance development in the constituent entities of the Arctic zone in the Russian Federation over a five-year period.

[1] Russian Far East and Arctic Development Corporation. URL: https://erdc.ru/about-azrf/ (accessed: 12.12.2021). (In Russian)

The Arctic is the Earth's northern polar region, which includes the outskirts of the continents of Eurasia and North America, almost the entire Arctic Ocean and its islands, with the exception of the coastal islands of Norway, as well as the adjacent parts of the Atlantic and Pacific Oceans. Five countries "border" the Arctic: Russia, Canada, USA, Norway and Denmark[2]. The Russian Federation possesses the largest land area in the Arctic zone which includes the following territories:

a) The territory of Murmansk region;
b) The territory of Nenets Autonomous Okrug;
c) The territory of Chukotka Autonomous Okrug;
d) The territory of Yamalo-Nenets Autonomous Okrug.

As well as some territories of the following constituent entities of the Russian Federation:

a) Republic of Karelia;
b) Komi Republic;
c) Republic of Sakha (Yakutia);
d) Krasnoyarsk Krai;
e) Arkhangelsk region[3].

The aim of this study is to determine the dynamics and direction of development of insurance in the land territories of the Arctic zone within the Russian Federation during the period 2016–2020, in the context of types of insurance and constituent entities of the Russian Federation. Due to the lack of statistical data on some territories of the constituent entities of the Russian Federation and for the purpose of objective research, the article analyzes the subjects: Murmansk Region, Nenets Autonomous District, Chukotka Autonomous District, Yamalo-Nenets Autonomous District (hereinafter referred to as the Subjects of the Arctic Zone).

The share of premiums collected by the Subjects of the Arctic Zone for voluntary and compulsory types of insurance based on the results of 2016–2020 ranged from 0.66 % to 1.54 % of premiums collected on the entire insurance market in the Russian Federation. In 2016 fees amounted to 7,742 million rubles and increased to 23,618 million roubles in 2020.

The structure of types of insurance in the Subjects of the Arctic Zone and total premiums collected during 2016–2020 is shown in Fig. 1 and is distributed in the following order: life insurance and personal insurance share — 49.04 %; voluntary and compulsory property insurance — 32.67 %

[2] The Arctic zone of Russia. URL: https://tass.ru/infographics/8349. (In Russian)

[3] Russia's Arctic territories have been defined. URL: http://en.kremlin.ru/acts/news/20895. (In Russian)

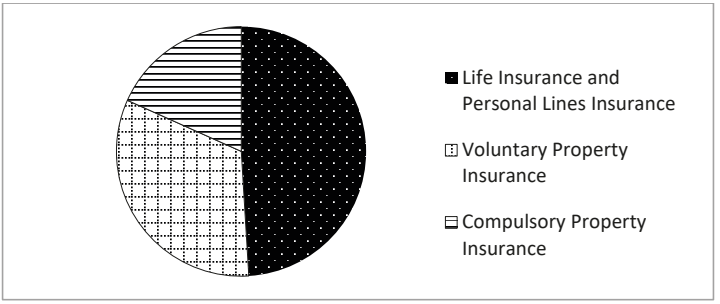

Fig. 1. Structure of insurance types 2016–2020
Source: Compiled by the author.

and 18.29 % respectively. Hereafter we will consider how the indicators of premium collection for each type of insurance changed during the specified period.

Table 1. **Information on insurance premiums in constituent entities of the Russian Federation: Nenets Autonomous Okrug, Murmansk Region, Yamalo-Nenets Autonomous Okrug, Chukotka Autonomous Okrug, thousand roubles**

No.	Type of insurance	2016	2017	2018	2019	2020
Voluntary and compulsory insurance (except for Compulsory Health Insurance) — total						
Life Insurance:						
1	**Life insurance**	1 285 567	1 901 302	3 443 303	2 698 360	4 415 431
Personal Lines Insurance (except Life Insurance):						
2	Accident and Illness Insurance	536 971	540 712	775 222	1 282 974	3 161 138
3	Health Insurance	1 619 053	1 857 706	3 022 192	2 040 744	1 985 845
	Total Personal Lines Insurance (except Life Insurance):	**2 156 024**	**2 398 418**	**3 797 414**	**3 323 718**	**5 146 984**
	Total:	**3 441 591**	**4 299 720**	**7 240 716**	**6 022 078**	**9 562 414**

Source: Compiled by the author on the basis of statistics of the Bank of Russia[4].

[4] Bank of Russia. URL: https://cbr.ru/statistics/insurance/ (accessed: 12.12.2021). (In Russian)

Table 1 provides information on insurance premiums for voluntary life insurance, accident and illness insurance, and health insurance in the Subjects of the Arctic zone. Here we can see annual continuous growth and increase by 3.4 times in the collection of life insurance premiums (including retirement and pension plans) by 2020. The volume of premiums for accident and illness insurance also shows a positive trend — the growth of premiums over the five-year period increased by 5.9 times. At the same time, health insurance developed unevenly, showing growth in the period 2016–2018. In year 2019 there was a decrease in fees by 32.5 % from the maximum fees in 2018, followed by another decline of 2.7 % in 2020.

Table 2 provides information on the insurance premiums for voluntary property insurance, with the exception of civil liability (data by type will be discussed below) for the Subjects of the Arctic zone. Land Transport Insurance is number one in the structure of property insurance (CASCO Insurance), showing insignificant changes in the volume of premiums during the specified period.

Business Property Insurance (other property of legal entities) showed continuous growth in specified period. According to the results of activities in 2020 — it soared 21.3 times compared to fees in 2016 and 13.93 times compared to fees in 2019. We observe insignificant annual fluctuations in Personal Property Insurance.

Taking into account the length of the northern marine route passing along the Arctic territories, the occupied share of marine insurance should be taken into consideration. Total premiums collected for Water Transport Insurance demonstrate that the share ranged from 2.19 % to 3.29 % of the entire market and is mainly represented by the Murmansk region. During the specified period, the considerable increase took place in 2019 (+27.19 % compared to 2018), in other periods the changes were within 10 % of the previous year's fees.

Financial Risk Insurance premiums peaked in 2018, with a further 37.01 % decline in 2019 and another 22.36 % decline in 2020. On the contrary Business Risk Insurance was stable in the same period, with insignificant annual fees (+/–1 million roubles) in 2016–2018. In 2019 fees rocketed up by 12.83 times and in 2020 there was a decline of 7.88 % compared to the volume of fees in 2019. There was a fee increase of 43.79 % for Cargo Insurance in 2020 compared to 2016. Air Transport Insurance premiums fluctuated irregularly and declined in 2017–2019. By 2020 the fees have increased to the level of 2016.

Railway Transport Insurance and Agricultural Insurance are poorly represented with annual fees less than a million roubles.

Table 2. **Information on insurance premiums by constituent entities of the Russian Federation: Nenets Autonomous Okrug, Murmansk Region, Yamalo-Nenets Autonomous Okrug, Chukotka AO, thousand roubles**

No.	Type of insurance	2016	2017	2018	2019	2020
Voluntary and compulsory insurance (except for Compulsory Health Insurance) — total						
Property Insurance						
Property						
4	Car Insurance (except for Railway Transport)	719 960	654 825	752 485	753 926	780 213
5	Railway Transport Insurance	509	530	349	318	279
6	Air transport Insurance	12 541	4 310	3 978	9 375	12 168
7	Water Transport Insurance	119 120	127 752	119 945	152 556	140 386
8	Cargo Insurance	13 963	12 239	12 600	15 020	20 078
9	Agricultural Insurance	434	181	14	9	12
10	Business Property Insurance (other property of legal entities)	470 774	464 802	537 031	719 295	10 019 170
11	Personal Property Insurance	353 545	340 213	359 255	373 703	369 475
12	Business Risk Insurance	1164	1207	734	9416	8676
13	Financial Risk Insurance	66 918	105 557	126 741	79 883	61 975
	Total (Property):	**1 758 928**	**1 711 616**	**1 913 132**	**2 113 501**	**11 412 431**

S o u r c e: Compiled by the author on the basis of statistics of the Bank of Russia[5].

[5] Bank of Russia. URL: https://cbr.ru/statistics/insurance/ (accessed: 12.12.2021). (In Russian)

Table 3 provides information on insurance premiums for voluntary insurance of civil liability for the Subjects of the Arctic zone. Water Transport Insurance occupies the leading position in the collection of premiums, without any dramatic fluctuations. Over the years the amount of fees ranged from 2 % to 13.77 %. The total share of premiums collected for civil liability insurance of water transport ranged from 2.93 % to 4.07 % of the entire market and, like Hull Insurance, is mainly represented by Murmansk region.

Civil Liability insurance for causing harm to third parties demonstrated an annual upturn in premium fees. By 2020 the fees increased by 2.05 times.

The fees for Civil Liability Insurance for non-performance or improper performance of obligations under the contract reached a maximum in 2016. In subsequent periods the premiums sharply decreased and during the last three years (2018–2020) rose insignificantly — up to 1 million roubles. The volume of fees for land transport insurance slightly fluctuated during 2016–2019 (up to 8 %). The year 2020 demonstrated a sharp decline in the volume of fees by 3.4 times.Premiums for Civil Liability Insurance against harm caused by deficiencies in goods, works and services also fluctuated in the specified period and by 2020 they decreased by 29.92 %.

Air Transport Insurance fees varied, reaching a maximum in 2019 (fees increased by 83.11 % compared to 2016). In 2020 there was a decrease in premiums by 21.79 % compared to 2019. Premiums for Civil Liability Insurance for Hazardous Enterprises, as well as for most types of liability, fluctuated. By 2020 fees increased by 1.85 times compared to 2016.

Table 4 provides information on insurance premiums for voluntary and compulsory property insurance for the Subjects of the Arctic zone. Compulsory personal insurance (State Life and Health Insurance of the Military and other types of compulsory personal insurance) was not provided by the Subjects of the Arctic zone during the specified period, and therefore, data are not presented.

The amount of fees for compulsory insurance of civil liability of vehicle owners (hereinafter — OSAGO) ranged from 1–11 % in the specified period. By 2020 fees increased by 7.59 % compared to 2016. OSAGO insurance was the leader in premium collection among those provided by the Subjects of the Arctic zone. In the specified period the share of OSAGO ranged from 9.84 % (in 2020) to 27.91 % (in 2016) of all fees for voluntary property insurance.

The fees for compulsory civil liability insurance for Hazardous Enterprises for damage caused by an accident show an uneven, mostly negative trend. By 2020 the volume of premiums decreased by 10.44 % compared to 2016.

Table 3. **Information on insurance premiums for the constituent entities of the Russian Federation: Nenets Autonomous Okrug, Murmansk Region, Yamalo-Nenets Autonomous Okrug, Chukotka Autonomous Okrug, thousand roubles**

No.	Type of insurance	2016	2017	2018	2019	2020
Voluntary and compulsory insurance (except for Compulsory Health Insurance) — total						
Liability Insurance						
14	Civil Liability Insurance of Motor Vehicle Owners (except Railway Transport Insurance)	57 342	54 647	58 102	57 508	16 904
15	Civil Liability Insurance of Railway Transport	–	–	150	150	150
16	Civil Liability Insurance of Air Transport	3025	2625	3019	5539	4332
17	Civil Liability Insurance of Water Transport	101 843	87 862	96 381	100 277	98 277
18	Civil Liability Insurance for Hazardous Enterprises	2158	1058	3804	4164	3992
19	Civil Liability Insurance against harm caused by deficiencies in goods, works and services	8771	9255	7057	6949	6147
20	Civil Liability insurance for causing harm to third parties	69 860	98 133	127 335	124 120	142 920
21	Civil Liability Insurance for non-performance or improper performance of obligations under the contract	89 075	3687	496	535	615
	Total (Liability)**:**	**332 074**	**257 267**	**296 343**	**299 242**	**273 337**
	Total (Voluntary Property Insurance):	**2 091 002**	**1 968 883**	**2 209 475**	**2 412 743**	**11 685 768**

S o u r c e: Compiled by the author on the basis of statistics of the Bank of Russia[6].

[6] Bank of Russia. URL: https://cbr.ru/statistics/insurance/ (accessed: 12.12.2021). (In Russian)

Table 4. **Information on insurance premiums by constituent entities of the Russian Federation: Nenets Autonomous Okrug, Murmansk Region, Yamalo-Nenets Autonomous Okrug, Chukotka Autonomous Okrug, thousand roubles**

No.	Type of insurance	2016	2017	2018	2019	2020
Voluntary and compulsory insurance (except for Compulsory Health Insurance) — total						
Compulsory Property Insurance:						
22	OSAGO	2 160 888	2 063 650	2 286 640	2 341 907	2 324 803
23	Compulsory civil liability insurance for Hazardous Enterprises for damage caused by an accident	31 366	25 465	24 905	28 516	28 093
24	Carrier's civil liability insurance for harm caused to passengers' life, health or property	17 178	14 588	15 836	20 429	17 232
	Total:	**2 209 432**	**2 103 703**	**2 327 381**	**2 390 852**	**2 370 128**

S o u r c e: Compiled by the author on the basis of statistics of the Bank of Russia[7].

Insurance of the carrier's civil liability insurance for harm caused to passengers' life, health or property is the "youngest" type of compulsory property insurance in the Russian Federation[8] and it has been provided since 2013. Fees also show uneven fluctuation and by 2020 stay at the level of 2016.

Figure 2 shows the dynamics of voluntary and compulsory types of insurance in the period 2016–2020. We can see stability of compulsory insurance throughout the entire specified period. At the same time we observe a decline in voluntary insurance in 2019 and an apparent boost in premium collection in 2020, many times higher than previous years. The main drivers for the increase in premium collection were: life insurance, accident and

[7] Bank of Russia. URL: https://cbr.ru/statistics/insurance/ (accessed: 12.12.2021). (In Russian)

[8] On Compulsory insurance of civil liability of the carrier for causing harm to the life, health, property of passengers and on the procedure for compensation of such damage caused during the transportation of passengers by Metro. URL: http://www.consultant.ru/document/cons_doc_LAW_131156/5ed34d8628f1ee2c59c8889f15d90cfd832317cf/ (accessed: 12.12.2021). (In Russian)

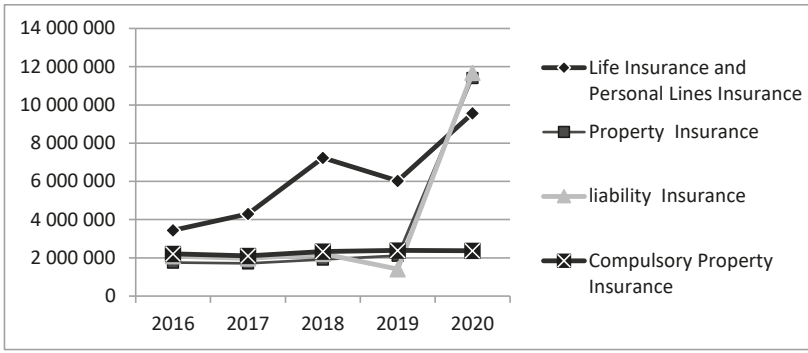

Fig. 2. The dynamics of voluntary and compulsory types of insurance in the period 2016–2020

Source: Compiled by the author.

illness insurance, business property insurance, insurance of civil liability for causing harm to third parties.

The share of insurance premiums collected by the Subjects of the Arctic zone in the period 2016–2020 ranged in Nenets Autonomous Okrug from 0.34 % to 1.5 %; from 26.77 % to 48.01 % in Murmansk region, from 48.95 % to 72.53 % in Yamalo-Nenets Autonomous Okrug from 0.36 % to 10.50 % in Chukotka Autonomous Okrug out of the total fees of the Subjects of the Arctic zone.

Figure 3 shows the dynamics of insurance premium collections for the Subjects of the Arctic zone in the period 2016–2020, total. The leaders of the Arctic zone in the collection of premiums are Yamalo-Nenets Autonomous Okrug and the Murmansk Region. At the same time in Yamalo-Nenets Autonomous Okrug we observe an annual increase in premiums and an upsurge in 2020 due to an increase in fees for business property insurance. The collection of premiums in Murmansk region mainly demonstrates positive development. In 2020 the increase in fees is due to life and personal insurance.

The share of premiums collected by Nenets Autonomous Okrug is insignificant compared to other Subjects of the Arctic Zone. In 2020 its volume of collections shows a negative trend in comparison with 2016. The situation is similar in Chukotka Autonomous Okrug, with the exception of 2018 when the growth in premiums was due to an increase in medical insurance premiums.

Analyzing statistical data on the collection of insurance premiums in the Subjects of the Arctic zone for a five-year period, certain conclusions can be drawn. In general, the insurance market of the Subjects of the Arctic

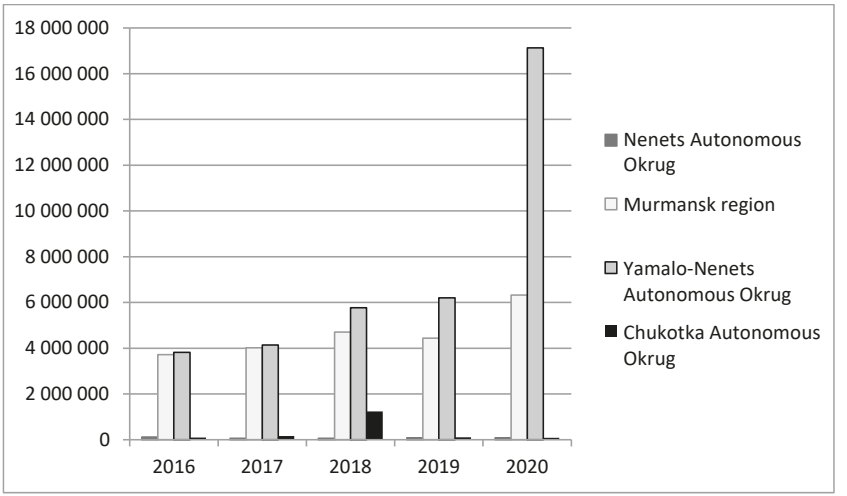

Fig. 3. Dynamics of insurance premium collections for the Subjects of the Arctic zone, 2016–2020, total

S o u r c e: Compiled by the author.

zone is provided with all types of voluntary personal and property insurance, compulsory property insurance, with the exception of compulsory personal insurance. In 2016–2020 the share of premiums collected by the Subjects of the Arctic zone for voluntary and compulsory types of insurance ranged from 0.66 % to 1.54 % out of premiums collected on the entire insurance market in the Russian Federation. The structure of insurance types is distributed in the following order: the share of life and personal insurance — 49.04 %; voluntary and compulsory property insurance — 32.67 % and 18.29 % respectively. The volume of fees for voluntary types of insurance shows a positive trend, reaching a maximum in 2020. The volume of fees for compulsory types of insurance shows stability during the entire specified period. Yamalo-Nenets Autonomous Okrug and the Murmansk Region are the leaders in the collection of premiums among the Subjects of the Arctic zone. At the same time in Yamalo-Nenets Autonomous Okrug we observe an annual increase in premiums and an upsurge in 2020 due to an increase in fees for business property insurance. The collection of premiums in Murmansk region shows mainly positive dynamics, increasing the collection of premiums by 2020 due to life and personal insurance. At the same time Murmansk Region is the leader among the Subjects of the Arctic zone in the collection of marine insurance premiums as the city is the largest seaport in the Western Arctic.

The state programme of a comprehensive project for planning and ensuring the socio-economic development of the Arctic zone is aimed at the implementation and development of the communication and resource potential of the Russian Arctic. It activates the transport capabilities of the Northern Sea Route, meridional river and road corridors, air and rail links, information communication to involve the fuel and energy, mineral and biological resources of the Arctic in the economic turnover [Dmitrieva, Bury, 2019].

The development of land and sea territories of the Arctic zone as well as an increase in population welfare and production potential, the future annual increase in the collection of insurance premiums for all types of insurance is a reliable prediction, property insurance, such as marine and other property insurance, insurance of goods and railway transport in particular.

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CHARACTERISTICS OF THE RUSSIAN EDUCATIONAL AND SCIENTIFIC RESEARCH PROJECTS IN THE CONTEXT OF TRAINING PERSONNEL FOR THE SUSTAINABLE DEVELOPMENT OF THE RUSSIAN ARCTIC

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This article is devoted to identifying the features of educational and research projects carried out by the Russian Federation for the sustainable development of the Russian Arctic. It aims to analyse courses, practical projects, and scientific conferences, as well as research collaborations conducted by Russian universities and research organisations. For instance, it explores the Lomonosov Northern (Arctic) Federal University (NAFU) in the Russian Arctic; universities and scientific programmemes in St Petersburg — the non-Arctic region of Russia; and the National Arctic Scientific and Educational Consortium project. Additionally, this paper uses data analysis and qualitative analysis to summarise the characteristics of the ongoing relevant educational and research projects to investigate their strengths and weaknesses and personal training through these characteristics. Ultimately, it seeks to propose future directions and fields in relation to the progress of the sustainable development of the Russian Arctic.

Keywords: Russian Arctic, personnel training, higher education, secondary vocational education, scientific research organisation.

Introduction

The Russian Arctic is central to Russia. And the development of talent will be vital if the Russian Arctic becomes sustainable. The Strategy for Development the Russian Arctic Zone and Ensuring National Security until 2035 clearly states that it involves the creation of scientific and educational centres in priority areas of fundamental and applied scientific research carried out in the interests of Arctic exploration[1]. This demonstrates how Russia values education and research in the Arctic, ensuring that the training of a new generation guarantees future success.

Mikheeva and Likhachova's article entitled "Specificity of staff training in St Petersburg for work in the Arctic Region" analysed the state of research and education in the Russian Arctic. It focuses on the projects and characte-

[1] On the Strategy for Development of the Arctic Zone of the Russian Federation and Ensuring National Security for the Period to 2035: official text: as of: 23.8.2021. URL: https://www.garant.ru/products/ipo/prime/doc/74710556/ (accessed: 23.8.2021).

ristics of human resources training in the St Petersburg region for the Arctic [Mikheeva et al., 2020]. Moreover, Zaikov et al. published "Analyzing Trends in Training Highly Qualified Personnel in the Interests of Strategic Development of the Arctic Zone of the Russian Federation", which investigated the trends in human resources training for the Russian Arctic region in light of the current needs of the Russian Arctic economy [Zaikov et al., 2020].

Furthermore, the innovative approach of this article involves a comprehensive examination of the characteristics of contemporary Russia's education and scientific research projects for the Arctic. It pursues a more macro perspective that is not limited to a particular Russian region or only for the demand for talents in a certain field like economic development. The objective of this article is to evaluate the current curricula, research projects, academic conferences and international cooperation of Russian universities and research institutions concerning the Russian Arctic region. It also summarises the current features of Russian research and education in the Arctic.

Taking these goals into account, this paper will include the following tasks:

1. Conduct quantitative analysis of the current Russian personnel training projects for sustainable development in the Russian Arctic (in the Russian Arctic, using Lomonosov Northern (Arctic) Federal University as an example; projects in the non-Arctic zone of Russia, using St Petersburg as an example),
2. Summarise the characteristics of the ongoing projects,
3. Provide recommendations for the improvement of personnel training mechanisms in consideration of the attributes of human resource training in Russia for the sustainable development of the Arctic region.

This article will adopt a data analysis approach. It will also utilise some of the relevant data obtained from the Federal State Statistical Service document initiated by the Russian Ministry of Education in 2018, which was conducted by the NAFU (e. g., the number of graduate students engaged in Arctic research by 2020). Such efforts are made since the Russian government has not published recent and publicly available official data on education and research projects conducted for personnel training in the Russian Arctic[2]. On top of this approach, the quantitative analysis of this paper en-

[2] Expert and analytical support for the implementation of state policy in the field of training for work in the Arctic zone of the Russian Federation and international cooperation within the framework of the University of the Arctic: official text: as of 12.1.2018. https://narfu.ru/hseml/nauka/nauchnye-rezultaty/proekty/ (accessed: 23.8.2021). (In Russian).

deavours to review the number of educational and research projects carried out in Russia in recent years for the Arctic region's sustainable development. Subsequently, it will take on an inductive approach to outline the present characteristics of education and research in the Russian Arctic accordingly.

Findings

The sustainable development of the Russia's Arctic region is multifaceted, encompassing both the preservation of its sovereignty and the protection of the Arctic's geopolitical security. Additionally, this region's advancement includes the promotion of its economic development, protection of its natural environment and cultural development, and improvement of the locals' quality of life. It can be said that all aspects of the development of the Russian Arctic region require significant human resource support. Hence, Russian education for the development of the Arctic region can be divided into two categories, namely higher education and secondary vocational education, both designed to fulfil the different levels of talent required for the Russian Arctic's development.

According to the Lomonosov Northern (Arctic) Federal University, there are 166 projects related to Arctic research as of 2018, including 73 undergraduate students, 29 master's students, 42 specialists, and 22 postgraduates[3]. The relevant fields of education include construction engineering and technology; applied geology, mining, oil and gas engineering and geodesy; education and educational sciences; mechanical engineering; earth sciences; biological sciences; clinical medicine; electricity and thermal power; technological safety and environmental engineering; and shipbuilding and water transport engineering and technology [Zaikov et al.,2020]. In relation to the number of graduates, the Federal State Statistics Service found a total of 23,871 graduates from 2015 to 2018, which included the total number of undergraduates, master's students and PhD students. In contrast, the number of PhD students working on Arctic research decreased from 716 in 2016 to 664 in 2020, while the total number of PhDs in Russia by 2020 was 87,752, and PhDs working on Arctic research in that year comprise only 0.7 % of the total number of PhDs in Russia[4].

[3] Expert and analytical support for the implementation of state policy in the field of training for work in the Arctic zone of the Russian Federation and international cooperation within the framework of the University of the Arctic: official text: as of 12.1.2018. URL: https://narfu.ru/hseml/nauka/nauchnye-rezultaty/proekty/ (accessed: 23.8.2021). (In Russian).

[4] Calendar for the publication of official statistical information on the socio-economic development of the Arctic Region of the Russia Federation. URL: https://gks.ru/free_doc/new_site/region_stat/arc_zona.html (accessed: 24.8.2021). (In Russian)

As observed from the above data, the number of higher education personnel currently working in Arctic research represents a negligible proportion of the Russian higher education pool and does not meet the current demand for personnel in the Russian Arctic. Second, a serious disciplinary imbalance exists in the study of the Arctic, with courses currently focused on scientific and technological studies like oil and gas extraction, biological sciences and environmental protection, and fewer courses on regional security, geopolitical studies, and indigenous cultural studies. It is worth noting that the current education system in the Russian Arctic region prioritises science over humanities.

To ensure the sustainable development of the ASRF, in June 2016, Russia established the 'National Arctic Science and Education Consortium' (after here NASEC) in Arkhangelsk. NASEC was implemented on the basis of the Lomonosov Northern (Arctic) Federal University. In addition, it aims to create a platform for the exchange of scientific and educational information, bring together the resources and personnel of all parties, and contribute to the socio-economic aspects of sustainable development involving the Russian Arctic[5]. NASEC consists of eight research institutes and 29 higher education institutions, and its research can be divided into three areas: natural science research, science and technology research, and social and human science research[6].

With respect to the training, NASEC organises annual research events, scientific conferences, seminars and youth research competitions for two reasons. First, it is for the training of higher education personnel in the Russian Arctic. Second, it aims to select the personnel for sustainable development in the Russian Arctic. From 2021 to 2022, with the support of "NASEC", a total of 13 scientific research activities are planned, including five international conferences, two European regional conferences, and the rest will be Russian national conferences[7]. The concluded ones were held in Russia, France, Switzerland, and Korea with topics covering environment and ecological protection, bioresearch in the Arctic, land and water transportation and communications technology of the Arctic, the Arctic culture, Aboriginal research, and socio-economic development. Despite the extensive coverage of the conference, there was an imbalance in the content, with only two of the 13 sessions discussing economic development and cultural

[5] Agreement on the establishment of a National Arctic Research and Education Consortium. URL: http://arctic-union.ru/upload/medialibrary/857/podpisannoe-soglashenie-natsionalnyy-arkticheskiy-konsortsium.pdf (accessed: 23.8.2021). (In Russian)

[6] Participants in the National Arctic Science and Education Consortium. URL: http://arctic-union.ru/contacts/ (accessed: 23.08.2021). (In Russian)

[7] Scientific activities. URL: http://arctic-union.ru/nauchnye-meropriyatiya (accessed: 23.8.2021). (In Russian)

studies in the humanities and the rest exploring natural sciences and science and technology.

The Lomonosov Northern (Arctic) Federal University (NAFU) is part of NASEC. It is one of the leading scientific organisations in the Russian Arctic with a good system of scientific and educational programmemes for training. Moreover, NAFU is located in Arkhangelsk at the Russian Arctic. Given its location and distinctiveness, many of the programmes offered are related to the Arctic studies. The education system is divided into higher education (HE) and secondary vocational education (SVE). HE includes three levels: undergraduates, postgraduates and PhD students. There are 31 undergraduate projects in total, 21 of which concern natural science and science and technology research. The primary scopes of these projects are hydrometeorology polar meteorology (ecology and nature management), the natural resource potential of the Arctic, biology (living systems of the Arctic and Subarctic), environmental protection and rational use of natural resources, technological machines and equipment, protection in emergencies, drilling of oil and gas wells, among many others. The other ten programmes focus on the humanities, specifically international relations in the Arctic, political and social sciences in the space of the Russian Arctic, political and social communications in the space of the Russian Arctic, pedagogical education and tourism economics and marketing management in tourism, Arctic Law, Foreign Regional Studies (European Studies: Arctic Vector)[8].

In total, there are mainly 27 master's degree programmes, including Ecology and nature management (Management of environmental risks in the Arctic), Oil and gas business (Development of oil and gas deposits of the Arctic shelf), and State and municipal administration (Management of the development of the Arctic territories)[9]. Equally important, the PhD programme has eight projects, with Fire Safety (Firefighting in Sub-Arctic Conditions) being one of the fundamental research areas[10].

The curriculum at NAFU exhibits that most of the courses are under the natural and technical sciences, and only a few are related to the social sciences. It is systematic and exhaustively delves into the sustainable development of the Russian Arctic. In secondary vocational education, NAFU offers nine programmes, namely Installation and maintenance of refrigeration and compressor units, Operation and maintenance of oil production facili-

[8] Educational programs. Bachelor's degree. URL: https://narfu.ru/studies/speciality/ (accessed: 23.10.2021). (In Russian)

[9] Educational programs. Master's Degree. URL: https://narfu.ru/studies/speciality/magistrat/ (accessed: 23.10.2021). (In Russian)

[10] Educational programs. Specialties. URL: https://narfu.ru/studies/speciality/speciality/ (accessed: 23.10.2021). (In Russian)

ties, and other practical courses for the development of the Russian Arctic[11]. In addition, NAFU also provides a platform to promote the employment of its graduates[12]. Graduates can browse the available internship programmes and job offers on the NAFU website. At the same time, the university holds regular company-graduate meetings to help graduates secure employment and companies recruit.

Although the Arctic Federal University is the most systematic scientific and educational organisation in the Russian Arctic in terms of training personnel, the Russian Arctic accounts for 18 % of the total territory of Russia. In this case, having only one well-established academic institution does not suffice in meeting the needs of the Russian Arctic for its development. Currently, there are no higher education institutions in regions with a large indigenous population in the Russian Arctic, such as the Nenets Autonomous Okrug. The imbalanced regional development of research and education in the Arctic is another major feature of Russian Arctic human resources development.

Arctic Personnel Training

Along with these universities and research organisations participating in NASEC, there are others that, although they are not participating in NASEC, offer courses and research projects related to the Arctic [Qian, 2018].

Taking St Petersburg as an example, the current courses offered by universities are divided into natural science research, science and technology research, and social and humanities research. The universities engaged in natural science research predominantly include the St Petersburg State Institute of Technology, St Petersburg State Agrarian University, and St Petersburg Mining University. Universities that are primarily involved in science and technology studies are St Petersburg Polytechnic University, St Petersburg State Electrotechnical University, and the Ustinov Voenmeh Baltic State Technical University. Meanwhile, those that conduct social and humanities research are St Petersburg University of Film and Television and St Petersburg University.

St Petersburg University (SPbU), one of the first universities to carry out Arctic research, has trained a large number of talents for the sustainable development of the Russian Arctic. It has notable experience in natural

[11] Educational programs. Secondary education. URL: https://narfu.ru/studies/speciality/collegedegree/ (accessed: 23.10.2021). (In Russian)

[12] Events and activities. URL: https://narfu.ru/studies/praktika/obyavleniya/ (accessed: 23.10.2021). (In Russian)

sciences, such as geology, hydrometeorology, and ecology[13]. For example, the master's programme Applied Polar and Marine Studies was initiated by both SPbU and the University of Hamburg in Germany. Besides, SPbU is known for its research capacity in the geopolitical and sociocultural aspects of the Arctic. A considerable number of doctoral theses from the University's Department of International Relations explore polar and Arctic issues each year. In terms of scientific conferences, SPbU hosts or co-organises numerous conferences and seminars on Arctic issues. For example, the annual China-Russia Arctic Academic Meeting, initiated by SPbU and the Ocean University of China, brings together Chinese and Russian talents working on Arctic research. This event is held alternately in both countries for the exchange of information and scientific results. To date, SPbU has 254 arctic-related project topics.

Looking at the Arctic education and research offered by the universities of St Petersburg, the conclusion is that St Petersburg provides a comprehensive range of talents for the sustainable development of the Arctic region, including nature, science and technology, and the humanities. This makes it one of the more complete regions in Russia in terms of the provision of Arctic education and research. As the second-largest city in Russia, St Petersburg has a natural advantage based on its location, allowing for in-depth research and training in the Arctic region.[14]

Both the NAFU in the Russian Arctic region and the educational and scientific research institutions in the non-Arctic region of Russia have broad expertise in cultivating talents engaged in Arctic research. However, problems, such as the imbalance in regional development and subject development, must be addressed.

Generally, the demand for Arctic personnel can be divided into two areas, particularly the demand for higher education talent and secondary vocational education talent. With the deployment and investment in the construction of infrastructures like mineral resource bases and transportation in the Russian Arctic, skilled professionals who can operate under extreme Arctic conditions have become scarce resources. According to Head Hunter's 2017 data analysis, construction workers are currently in shortage in the Arctic, accounting for 41 % of the total open positions[15].

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[13] Higher education specialties in St Petersburg: Bachelor areas of study. URL: https://spb.postupi.online/specialnosti/bakalavr/ (accessed: 23.9.2021). (In Russian)

[14] 'We are creating a new North": the first ever Congress of the University of the Arctic opened at St Petersburg University. URL: https://spbu.ru/news-events/novosti/my-sozdaem-novyy-sever-v-spbgu-otkrylsya-pervyy-v-istorii-kongress-universiteta (accessed: 23.8.2021).

[15] How to work in the Arctic? URL: https://www.fontanka.ru/longreads/arctica/ (accessed: 23.08.2021).

Together with the shortage of skilled personnel, the unbalanced development of talents must be considered, mainly in the form of a mismatch between the training of talents and the labour market. The latter often results in the disparity between the specialisation of graduates and the direction of their employment. Consequently, it causes the retraining of graduates for employment and affects the progress of the implementation of several local projects. These issues have resulted in a large percentage of graduates switching careers, causing brain drain. Secondly, the extreme weather conditions in the Arctic (extreme cold, polar days and nights), which lead to unstable working hours, are also reasons for the brain drain. For example, during the winter season, navigation is not possible. In turn, crews can only carry out ship overhaul work and pay drops, and crews in the Laptev Sea can only work normally from July to September.

Conclusion

The Russian government has made corresponding policy support for the sustainable development of talents in the Russian Arctic in recent years. Meanwhile, universities and scientific research institutions have also established relevant courses in line with national policies. Nevertheless, the demand for talents in this region continues to exceed the supply of talents. In the field of higher education and research, there is an emphasis on natural sciences and scientific disciplines being directly related to economic development while neglecting relevant courses and research in the humanities and social sciences. It is also worth noting that there is a severe imbalance in the regional development of higher education, with the level of research and personnel training in economically advanced cities, such as St Petersburg, being significantly higher than in less economically developed regions. Meanwhile, the demand for talent and expertise in research and conservation in the Russian Arctic, especially in the indigenous areas, has become increasingly urgent in the context of its sustainable development goals, both in terms of the weak ecological environment and the region's deteriorating cultural language.

There is also a significant shortage of secondary vocational education. Since the first step in the development of the Russian Arctic is the construction of infrastructure, the demand for construction workers with specialised knowledge is most acute. Apart from the environmental constraints discussed above, inadequate vocational education and the lack of government support are key influencing factors in the current brain drain in secondary vocational education.

In response to these problems, several measures could be taken. The Russian government's sustainable development of education and scientific research in the Russian Arctic should not just stay on paper as it has become even more crucial to implement it in the Arctic region. Moreover, the government can promote the establishment of higher education and research institutions in Aboriginal communities. The implementation of this project can start from two aspects. On the one hand, it is vital to rely on the experience of advanced domestic universities by harnessing their expertise and resources in Arctic scientific research, introducing appropriate talents, and combining local characteristics to engage in research in areas of expertise. On the other hand, we are strengthening our ties with foreign universities and research institutions. Asian countries are highly interested in Arctic research, and we can utilise their research capabilities and funding to jointly promote the exploration of natural resources and social and humanistic research in the Russian Arctic.

Recognising the imbalance in the regional development of higher education, we should initially attempt to address the regional differences. Then, regions with strong scientific research capacities should assist backward regions. This does not preclude the further development of research capacity in the former, especially in areas related to economic development like natural resource exploration and maritime technology. Simultaneously, the power of cutting-edge technology should not be ignored, but the proportion and scope of investment in research should be taken into account.

The issue of unbalanced discipline development must not be overlooked. Considering the characteristics of humanities and social disciplines, it demonstrates that while it cannot directly yield short-term economic benefits, its long-term gains cannot be underestimated. Thus, universities with strong academic research capabilities can be encouraged to develop this direction vigorously and actively promote international cooperation and information exchange.

In terms of secondary vocational education, Russia requires a professional education system that focuses on the needs of the labour market in the Russian Arctic. A school-enterprise cooperation mechanism could be established, where the needs of the labour market are fed directly to educational institutions, which offer targetted training accordingly. Concerning problems like unstable working hours, the local labour sector could carry out overall and standardised scheduling to help with subsidies and monitor the free time of the workers for jobs that work specific hours.

The last point is the inter-regional deployment of talents, not only within Russia but also internationally. The Russian Arctic can attract the best scientific talents from developed regions, such as Moscow and St Pe-

tersburg, as well as from Asian countries like Japan and China. In this way, they could ensure that appropriate talents are brought in without leaking state secrets. Finally, in vocational education, the country could recruit labourers from less economically developed regions to work in seasonal jobs.

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CHINA AND RUSSIA BUILDING THE ICE SILK ROAD: THE ROLE OF CHINA'S INSURANCE INDUSTRY

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This article analyzes the areas in which China's insurance industry can participate in the construction of the Ice Silk Road and provide financial support and insurance services for the construction of the Ice Silk Road economic belt. By supporting the development of infrastructure construction, shipping, trade, and other projects, the construction of the Ice Silk Road economic belt will be promoted. Insurance services provide protection for Chinese enterprises to carry out trade and investment in the Ice Silk Road economic zone, reduce the risk of enterprises and promote the development of the economy along the Arctic route. China and Russia are cooperating on regional insurance integration, developing the digital insurance industry, forming the insurance ecology of the Ice Silk Road, cooperating with insurance institutions, providing specific insurance products and services for the construction of the economic belt, and developing the Ice Silk Road. It can provide continuous risk protection, which is conducive to the economic development of both sides and the sustainable development along the Arctic waterway.

Keywords: insurance industry, Ice Silk Road, Arctic route, China-Russian cooperation, insurance funds, risk, regional integration.

Introduction

The Ice Silk Road is of a great importance for the economic development of both Russia and China. Through this corridor, Russia and Asian countries can carry out extensive trade, solve the problem of economic sanctions in the United States and Europe, and create favorable conditions for the development of the Far East With the help of the Arctic route, China can solve the problem of energy security and the "Malacca" dilemma in the security of maritime trade routes. However, the development of the Arctic route faces significant risks, and the insurance industry is an important guarantee for the construction of the Ice Silk Road, which requires the support of insurance funds and the insurance industry to provide overseas investment protection to promote the development of the project and diversify risks. This will facilitate project development and risk diversification.

After 40 years of continuous high growth since the reform and opening up [Efimova et al., 2019], China's insurance industry has grown into an important force to protect China's economic development and has participated in the construction of major economies in the world through various forms. By participating in the construction of the Ice Silk Road, China's insurance

industry can effectively expand its business areas, extend its products and services, and enhance the efficiency of insurance fund management and increase the investment returns of insurance funds [Kobzeva, 2021].

The development of Arctic shipping routes, energy, and tourism can contribute to the economic growth of countries and regions along the route, but there are also huge risks in terms of ecology and environment[1]. It will be an irreversible development trend for China's insurance industry to deeply participate in the development of the Arctic route and the development of ports and hinterlands along the route, to develop economic, political, and cultural cooperation with countries and regions via the Arctic route region, and to jointly build a blue economic corridor between China and Europe and North America via the Arctic Ocean [Xiaoguang et al., 2021].

In the context of the global new crown pandemic hitting the economic development of various countries, escalating trade friction between China and the United States, and facing economic structural transformation, the Ice Silk Road economic belt has the potential to become a new impetus for China's industrial transformation and upgrading and economic growth. At the same time, the success of the Belt and Road economic belt, but also for the opening of the Arctic route and the construction of the Silk Road economic belt on ice to provide a model for reference. The economic and trade cooperation between Russia and China is gradually deepening, and within the framework of the Belt and Road international economic cooperation, a long-term structure of infrastructure construction, trade industry chains, supply chains, service chains, and value chains based on trade routes is being formed [Zan et al.,2021].

An Insurance Fund to Support the Construction of the Ice Silk Road

Russia is a major country along the Arctic route, and China and Russia have developed extensive cooperation in infrastructure and energy projects and promoted the deepening of regional economic integration. At the same time, in order to attract foreign investment, Russia is constantly improving its legislation and the investment environment is developing in a direction favorable to cooperation. The Asian Development Bank (ADB) and other financial institutions are investing in the construction of international trans-

[1] Kuo-Jui Wu, Ming-Lang Tseng, Mohd Helmi Ali, Bing Xue, Anthony S. F. Chiu, Minoru Fujii, Ming Xu, Shulin Lan, Maomao Ren, Yan Bin 2021. Opportunity or threat in balancing social, economic and environmental impacts: The appearance of the Polar Silk Road. *Environmental Impact Assessment Review* 88: 1–17. DOI: https://doi.org/10.1016/j.eiar.2021.106570

port corridors, port and airport construction projects in Russia, which are increasing year by year. The Far East and Baikal Development Foundation and Chinese investment partners have also created two cooperation funds that focus on investments in infrastructure and tourism projects [Renzhen et al., 2019]. These changes provide a favorable external environment for Chinese insurance funds to participate in the construction of the Ice Silk Road.

At the early stage of the construction of the Ice Silk Road, the investment of relevant funds is huge and cannot be completed by any one country alone. Therefore, if the Arctic route project wants to make progress, it must rely on the financial support of international multilateral financial institutions, and the project construction and enterprise development in related fields need the participation of diversified capital such as banks and insurance funds.

China's insurance industry can play the capital financing function of insurance and provide financial support. China's insurance industry is one of the three major financial industries, and in the third quarter of 2021, the total asset size of China's insurance industry reached 225,814 billion CNY, making it the largest institutional investor in China's financial market outside of commercialbanks. Insurance funds can provide large, long-term, and stable construction funds for infrastructure construction [Xue, 2021] Fig. 1. Changes in the scale of insurance funds in China.

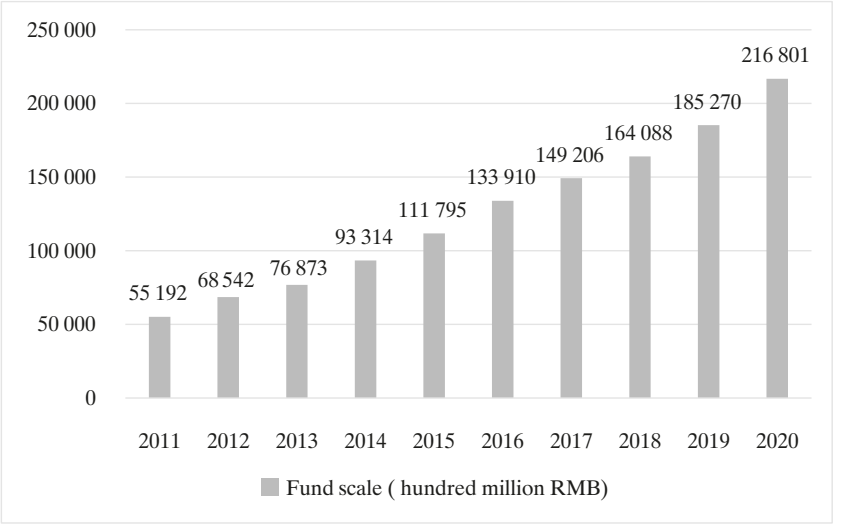

Fig. 1. China's insurance fund scale, 2011–2020
Source: [Xue, 2021].

At the same time, commercial insurance companies, as capital providers, are non-government in their investment behavior, effectively avoiding unnecessary political association and political risks in overseas purchase investment. The China Banking Regulatory Commission (CBRC) has licensed insurance funds to invest in the financial markets of 45 countries and regions abroad, so insurance companies can give full play to their right to allocate funds independently and optimize asset allocation in a broader geographical area. In addition, with the deepening of the Ice Silk Road economic belt, the demand for capital for energy resources development will gradually increase, which will inevitably increase the investment opportunities for Chinese insurance companies. As the investment yield in China's internal market decreases year by year, as shown in Figure 2, insurance funds invest in foreign markets to obtain income, becoming an important channel for the insurance industry's investment income. Important channel of the insurance industry, and after the relaxation of regulatory policies in 2015, the scale of overseas investment of Chinese insurance funds has been rising rapidly year by year. The total amount of outbound investment by Chinese enterprises was USD 102.9 billion in 2014 and rose to USD 124.393 billion by 2019. Accordingly, the underwriting rate of investment in countries along the route also rose from 24.5 % in 2014 to 33.8 % in 2019.

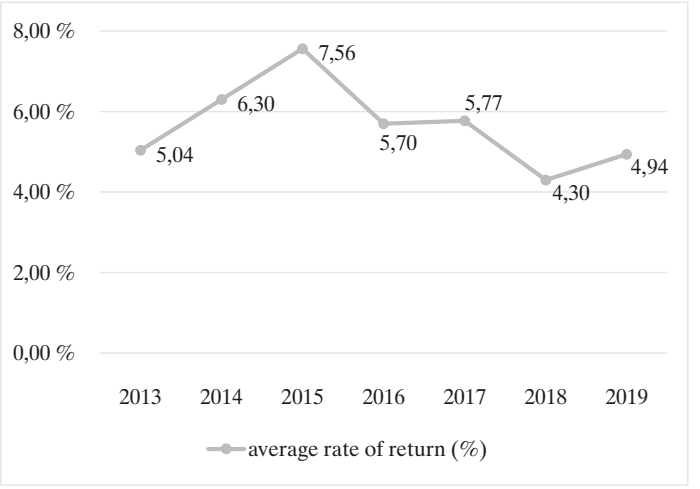

Fig. 2. Average annual profitability of insurance funds, 2013–2019
Source: _____.

China's outward foreign direct investment in 2020 is $153.71 billion, up 12.3 % year-on-year, ranking first in the world for the first time in terms of

scale. The scale of China's FDI continues to expand, with growth accounting for more than 10 % of the global share for five consecutive years and 20.2 % in 2020. By the end of 2020, China's outward FDI stock reached US$2.58 trillion, ranking third in the world, with a stock size of 6.6 % of the global share, up 0.2 percentage points from the previous year.

More than 50 insurance institutions in China have launched overseas investment business through QDII and other channels, with the investment balance exceeding USD 77 billion, accounting for about 3 % of the total assets of the domestic insurance industry, which is still a large space from the regulatory limit of 15 % of overseas investment. In terms of the structure of overseas assets, the allocation ratio of traditional assets and alternative assets is close. According to the data of the China Banking Regulatory Commission, traditional investments such as bank deposits, stocks, bonds, deposits, and funds account for about 47 %, and alternative investments such as equity investment funds and real estate account for about 52 % [Junhui, 2020].

In the process of the construction of the Ice Silk Road economic belt, large-scale capital is needed for protection, and insurance can promote financing, which is an effective way to promote the construction of supporting facilities for the Arctic route through financing. A special policy on insurance financing should be formulated for the export of large sets of national equipment to provide financial support to enterprises in industries involved in the construction of the Ice Silk Road economic belt, such as telecommunications, electricity, highways, railroads, oceans, ships, etc., and to provide supporting facilities and equipment for shipping and trade, as well as for the construction of the economic belt [Zhimin, 2018; Tianming, 2018]. With the opening of the Arctic route, Chinese trade will likely avoid the Suez Canal route, and the construction of ports and economic parks along the Russian Arctic will provide a good platform for insurance capital investment [Guo et al., 2022].

In recent years, the China Banking and Insurance Regulatory Commission (CBIRC) has gradually formulated liberal policies in favor of insurance funds' overseas investment, including measures such as opening up insurance funds to set up investment venture capital and approving insurance funds to set up private equity funds, which have expanded the scale of insurance funds invested by Chinese insurance enterprises outside China. Chinese insurance funds are becoming the mainstream direction to invest in infrastructure construction with operational nature. During the construction of the Ice Silk Road economic belt, Chinese insurance companies can systematically invest insurance funds in long-cycle, low-risk, and robust infrastructure projects such as aviation, ports, logistics, industrial parks, wa-

ter conservancy, etc. to support the continuous development of the projects [Yan, 2019].

At the same time, it can also participate in infrastructure construction in the form of project debts, or through insurance companies' equity participation in companies to provide continuous low-cost and stable funds for the construction of the economic belt. Chinese insurance companies can also set up venture capital or special funds to provide financial support to various small and medium-sized enterprises along the route and provide venture capital to high-tech enterprises participating in the Ice Silk Road to promote the research and development of advanced technology and equipment.

China's Insurance Industry Provides Risk Protection for the Construction of the Ice Silk Road

The Chinese insurance industry will participate in the construction of the Russian-Chinese Ice Silk Road, not only by providing financial support for this strategic project but also by providing risk protection for the project, which will serve as financial compensation in case of huge losses caused by accidents.

The construction of the Ice Silk Road is of strategic importance for China and Russia [Chenran et al., 2018]. However, the natural geography of the Arctic region is extremely complex, covered with snow and ice all year round, and extremely cold, which brings great uncertainty to the construction of the Ice Silk Road. Although global warming will not cease anytime soon, merchant shipping is still seasonal. Although the Ice Silk Road is jointly initiated by China and Russia and built with the countries along the route, its construction may encounter many risks and challenges [Zhimin et al., 2018]. Therefore, insurance must provide risk protection for the construction of the Ice Silk Road.

The riskiness of the construction of the Ice Silk Road comes from external threats and internal obstacles. The external threats include the geopolitical games of the Arctic countries led by the U.S. and Russia and the scruples of the Arctic Council, among which the geopolitical risks mainly come from the boundary dispute between the U.S. and Canada in the Beaufort Sea, the dispute between Russia and the U.S. over the legal status of the Bering Strait boundary and the Northeast Passage, and the dispute over the continental shelf boundary between Russia and Norway and Denmark. Another external threat is the competition from the participation of Japan and South Korea in Arctic development, which is mainly reflected in the fact that China's participation in Arctic development lags behind Japan and South Korea in terms of soft power in environmental protection, hard power in science and

technology, and soft power in humanities [Woon, 2019]. The internal obstacles include China's limited capacity for integrated activities in the Arctic, uncertainty about the expected navigability of the Arctic shipping lanes due to the unpredictable size of the Arctic ice and snow, and the constraints on development activities due to the fragile ecology of the Arctic [Long, 2018].

The position of insurance in foreign trade is gradually highlighted and paid attention to by relevant authorities. In 2017, the former China Insurance Regulatory Commission (CIRC) issued the Guiding Opinions of the CIRC on the Insurance Industry's Service to the Construction of the Ice Silk Road, which emphasized the status of the insurance industry, indicated the strategic direction of the insurance industry's participation in the construction of the Ice Silk Road and gave guidance, proposing to build a support system for the insurance industry to serve the foreign trade of the Ice Silk Road [Jingsen, 2015].

In the process of participating in the Ice Silk Road, Chinese enterprises need insurance protection. At present, the insurance protection products for the construction of the Ice Silk Road are divided into the following three categories:

The first category is liability insurance, enterprise property insurance, engineering insurance, and overseas investment insurance, etc., which provide risk protection arrangements for overseas investment and facility construction on the Ice Silk Road. The main targets of the construction and investment of the Ice Silk Road are mostly countries along the Arctic shipping route, and the industries in which Chinese enterprises invest in the Ice Silk Road countries are mostly related to steel, mineral resources development, transportation, and machinery manufacturing. In addition to the risks associated with the complex political, economic and social environment of each country, the operations of these industries are highly technical and usually involve high investment and risk, making it extremely difficult for insurance companies to identify and manage the various risks. Although the operation of these industries requires liability insurance, corporate property insurance, and overseas investment insurance for risk management and protection, the development of such insurance in China is weak, and domestic insurance companies have little participation in the market and lack practical experience.

The second category is export credit insurance, cargo insurance, ship insurance, cross-border vehicle insurance, etc., which guarantee the smooth operation of export trade.

Export credit insurance provides enterprises with higher protection by sharing the risk of receiving foreign exchange so that they can undertake business with higher risk levels, enhance their ability to receive orders, and

improve their international competitiveness. The coverage rate of China Credit Insurance in China's export service enterprises has been increasing year by year, reaching 68.5 % in August 2017. Short-term export credit insurance was approved at the end of 2013, but commercial insurance companies have not participated much in this market. China Credit Insurance has more than 90 % coverage in the market, and the market lacks the necessary competition, innovation, and a single product range to cope with the risks faced by enterprises in different countries and industries.

Cargo insurance and ship insurance are relatively mature compared to other types of insurance, and these two types of insurance involve more insurance companies and the most intense competition. Shipping insurance and ship insurance provide risk protection for ships and cargo transportation in international trade and economic activities. However, for the healthy development of shipping insurance, it is necessary to change the situation of excessive competition in the low-end market and difficult breakthroughs in the high-end market, promote product innovation and change the market pattern.

Cross-border auto insurance has a large coverage and relatively mature development at this stage. For example, it has basically achieved full coverage of cross-border auto insurance at major ports such as Dongxing and Pingxiang in Guangxi, and gradually built up the service network of cross-border insurance. Through the service network and the provision of multi-faceted insurance services, Guangxi's major ports have realized the efficient operation of underwriting, claim settlement, and customer service processes on the front line. In general, the level of cross-border auto insurance coverage is compatible with the demand of border trade of existing vehicles entering and leaving Guangxi, and the development is good [Gang et al., 2018].

The third type of insurance is related to personnel, such as cross-border laborers' life insurance. Promoting the construction of cross-border personal insurance is conducive to protecting the legitimate rights and interests of cross-border workers, and is of positive significance to maintaining economic and trade prosperity and stability and people-to-people relations between China and the countries along the border. Due to the further opening up of China's foreign trade, the number of inbound border workers is gradually increasing. The insurance industry has been innovating on personal insurance for cross-border workers and has created the first government-led, mandatory enterprise purchase of cross-border workers' accident insurance service that can be handled directly outside of China.

As a special industry for managing risks, the insurance industry has its own characteristics that determine its natural advantages in serving the construction of the Ice Silk Road.

As a special industry for managing risks, the insurance industry can provide personalized risk protection services for the construction of the Ice Silk Road. The risk situation of many large-scale projects in the Ice Silk Road is extremely complex, including political, economic, social, natural, legal, and other aspects, and there is an urgent need for risk protection. The insurance industry can develop personalized insurance products, such as engineering insurance, liability insurance, cargo transportation insurance, ship insurance, energy insurance, overseas investment insurance, overseas lease insurance, buyer's default insurance, overseas travel insurance, cross-border merger, and acquisition insurance, credit insurance, heavy equipment insurance and personnel kidnap and ransom insurance, etc., and provide specialized risk consulting value-added services for the Ice Silk Road. The company provides specialized risk consulting and value-added services to build reliable protection for the Ice Silk Road.

With the exploration of the Ice Silk Road project, a large number of overseas Chinese enterprises and large-scale infrastructure construction projects will choose to take out insurance in the future. The insurance industry, as a provider of risk protection, also needs to face the application of new products and conventional products in the new environment, which requires insurance companies to continuously enhance the awareness of cross-border risk prevention and risk control capabilities.

Prospects of Russian-Chinese Cooperation in the Field of Insurance on the Ice Silk Road Economic Belt

China-Russia Insurance Regional Integration Cooperation. Since 2010, when China and Russia established the tourism safety insurance cooperation mechanism, the insurance agencies of both sides have been providing a platform to reduce the cost of coordination between the governments of both countries in terms of tourism safety and insurance in case of danger. The cooperation between Russian and Chinese insurance companies is the first of its kind in Russia and China. It provides a strong guarantee for the development of tourism and the exchange of people between the two countries.

The signing of the Action Plan for the Development of China-Russia Insurance Industry Cooperation identifies the key areas and specific requirements for China-Russia insurance industry cooperation, promotes the investment of insurance funds by both sides, cooperation in the insurance industry to serve large projects, and supports eligible insurance institutions to enter each other's insurance market to carry out business, etc. The Outline of the China-Russia Investment Cooperation Plan identifies the priority areas for Chinese investment into Russia. The mechanism of regular meet-

ings between the prime ministers of the two governments and the series of agreements reached on economic, trade, and investment cooperation has laid the foundation for the cooperation between Chinese and Russian insurance enterprises in relevant fields and provided legal protection for Chinese insurance funds to invest in the Arctic route economic zone.

The Russian and Chinese governments also need to improve policies to support insurance regional integration and guide insurance institutions to actively participate in the development of the Ice Silk Road economic belt. It should also formulate institutional regulations on cross-border operation, intermediation, and supervision of insurance regional integration, develop digital insurance with the help of digital insurance technology, and promote the construction of insurance regional integration.

Matching of insurance products and services. Under the Ice Silk Road initiative, Russian and Chinese insurance companies can seamlessly connect insurance products and services. As the economic and trade relations between the two countries are developing, the cooperation in the field of insurance is expanding. There is a wide scope for cooperation between the two countries in the areas of insurance project cooperation, financing and risk protection of major projects, and the development of cooperation in key insurance fields [Nepeyvoda, 2019].

The prospects of cooperation between Russian and Chinese insurance companies are mainly reflected in the following aspects:

First, to make the insurance industry cooperation mechanism more practical and to promote the exchange between the two sides;

Second, to strengthen the cooperation between the insurance industry and improve the service level;

Third, we should develop customized insurance products (liability insurance, enterprise property insurance, engineering insurance, overseas investment insurance, export credit insurance, cargo insurance, ship insurance, cross-border auto insurance, and personal insurance for cross-border laborers, etc.) by the market development trend.

Fourth, we should learn from each other about insurance technology and improve the digitalization of the insurance market in both countries.

Fifth, we should make new key areas of cooperation to expand the service space of the insurance industry.

In short, the Ice Silk Road responds to the world's development requirements and provides new ideas and ways to solve outstanding problems in the social, economic, and trade spheres [ZF et al., 2018]. Under the Ice Silk Road initiative, the insurance industry of China and Russia has broad prospects for cooperation, which provides new opportunities for the development of the insurance markets of both countries [Yin'an, 2019]. The Russian

and Chinese insurance industries need to actively grasp this development opportunity, optimize the structure of insurance products, improve the level of insurance services, create an international insurance brand on the Internet and improve the internationalization of the insurance markets in Russia and China, and vigorously promote the regional integration of insurance to provide a strong guarantee for the implementation of the Ice Silk Road initiative and at the same time, promote the development of the insurance industry. Promote the development of the insurance industry.

Sino-Russian Digital Insurance Cooperation. China and Russia are cooperating extensively on projects in the field of the digital economy in telecommunications, big data, Internet of Things, robotics, artificial intelligence, smart cities, etc. Chinese high-tech companies have set up research centres, technology centres, and logistics centres in Russia to take advantage of scientific, technological, engineering, and mathematical expertise, giving full play to the comparative advantages of China and Russia in terms of talent, capital, and management in developing the digital economy. Artificial intelligence is a priority area of cooperation between Russia and China, and the two sides are committed to jointly promoting the application of big data, and the application of big data technologies such as health codes in the fight against epidemics provides experience for cooperation between the two countries [Xie, 2021].

The development of the digital economy has enabled the optimization of insurance business models and become a new driving force for innovation and development in the insurance industry [Belozyorov, 2018]. Along with the progress and integration application of mobile internet, big data, cloud computing, artificial intelligence, blockchain, and other technologies, digital technology is flourishing. Chinese and Russian companies should strengthen the cooperation in research and development and application of insurance technology. Through the use of insurance technology, they should develop insurance products suitable for the "Ice Silk Road" economic zone and introduce traditional insurance products into the construction of the "Ice Silk Road" economic zone by using mobile Internet technology.

Chinese and Russian insurance companies can use big data to improve underwriting risk control and drive business capabilities, use cloud computing technology to broaden underwriting scenarios and capabilities related to the Ice Silk Road economic zone, use blockchain to improve data collection and processing efficiency in the Ice Silk Road economic zone. We will use blockchain to improve data collection and processing efficiency in the Ice Silk Road economic zone, promote the integration of Internet scenarios with the Ice Silk Road insurance needs and provide insurance technology support for insurance service and product innovation in the Ice Silk Road.

Chinese and Russian insurance institutions should re-frame the value chain of insurance enterprises related to the Ice Silk Road through cooperation, reshape product design, actuarial pricing, sales management, risk underwriting, claims, and other aspects, build a new insurance industry, and reconstruct the Ice Silk Road based on insurance technology. The insurance industry ecosystem suitable for the Ice Silk Road economic zone will be reconstructed based on insurance technology.

Conclusion

After the opening of the Ice Silk Road, a convenient route connecting Asia, Europe, and North America will emerge. The trade between China and the countries along the route will be more convenient, and the cooperation between the two sides in trade, transportation, and personnel exchanges will grow, and the trade between China and the regions of Europe and North America will shift to the Arctic route, and a new economic belt will be formed along the route [Xianjin et al., 2019]. China and Russia can provide technical, service, and equipment support for enterprises, personnel, and transportation of both sides through joint ventures and foundations. Guide insurance funds to invest in enterprises related to the development of the Arctic route, provide financial support for enterprises and provide overseas investment protection for enterprises.

The construction of the Ice Silk Road can become an important practice for the effective docking of the Belt and Road Initiative with the construction of the Eurasian Economic Union. As a coastal state of the Arctic Ocean and a de facto manager of the Northern Passage, Russia is the main partner of China in the development of the Ice Silk Road. The joint construction of the Ice Silk Road is a consensus between the leaders of Russia and China. The Ice Silk Road is an element of dovetailing cooperation between the two sides and can become a new field for deepening the strategic partnership between Russia and China. Currently, the two sides are discussing how to achieve a more effective docking and how to make the connotation of the Ice Silk Road more concrete, more in line with their respective development realities and needs, and more in line with the need to promote the construction of the Belt and Road in the coming period.

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ANNEX 1

SUSTAINING ARCTIC OBSERVING NETWORKS (SAON)

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The Sustaining Arctic Observing Network (SAON) is a joint initiative of the Arctic Council and the International Arctic Science Committee (IASC) that was established at the Nuuk Declaration 2011 with the aim to strengthen multi-national engagement in and coordination of pan-Arctic observing. The Declaration followed on several years of discussions amongst the AC, IASC and other partners in efforts to create a coordinated Arctic observing network that would meet identified societal needs.

Keywords: Arctic; sustaining; observing; data; Indigenous knowledge; societal benefit; essential variable; shared Arctic variable.

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Building on the recommendations from the External Review, in 2018, SAON approved a new Strategy and Implementation Plan[2]. In its new Strategic Plan, SAON identified the need for a Roadmap for Arctic Observing and Data Systems (ROADS) and set forth a bold vision to develop a ROADS process. ROADS marks a transition in SAON's focus from community-building and partnership development towards a more active vision for the systematic design and implementation of the Arctic Observing System.

[1] Documents and Publications of SAON. https://www.arcticobserving.org/publications (accessed: 10.02.2022).

[2] Strategy and Implementation Plan of SAON. https://www.arcticobserving.org/strategy (accessed: 10.02.2022).

SAON ROADS Process

The lack of a consistent and holistic mechanism to assess observing system priorities and link independently funded efforts across the Arctic is a shortcoming that has hindered adaptation strategies and hampered funding responses for an improved observing system. SAON ROADS [Starkweather et al., 2021] proposes to address this shortcoming by generating a systems-level view of observing requirements and implementation strategies, across SAON's many partners. It is recognized that a critical success factor for ROADS is the equitable inclusion of Arctic Indigenous Peoples in the design and development process, using the design of process to build needed equity.

The ROADS process will build on the societal benefit-based approach of the International Arctic Observing Assessment Framework and will proceed step-wise so that the most imperative Arctic observations — Shared Arctic Variables (SAVs) — can be rapidly improved. SAVs will be identified through rigorous assessment at the beginning of the ROADS process, with an emphasis in that assessment on increasing shared benefit of proposed system improvements across a range of partnerships from local to global scales.

Recent Activities

As SAON and the ROADS process moves forward, there are an increasing number of global and regional efforts that could have an impact on how SAON will evolve over the coming years. It was determined by the SAON Board that it would be valuable to organise a series of virtual workshops to discuss various options and recommendations surrounding SAON governance. Over the past months, four such workshops have been held on the topics of: National Structures, the CON, Relations with the AC Working Groups and the ROADS Advisory Panel[3].

Discussions at these workshops consistently acknowledged the need to work closely with, and respond to priorities of, Indigenous groups and Permanent participants in a meaningful manner. There was recognition that more involvement from Indigenous people is needed in Arctic observing and in the emerging governance surrounding ROADS process.

[3] SAON Governance Review. Workshop #1 — ROADS Advisory Panel. Part A — Background and Context as of July 30, 2020. https://www.arcticobserving.org/publications (accessed: 10.02.2022).

Next Steps

Building on the discussions from previous SAON virtual workshops, a workshop on Engagement with Arctic Council Permanent Participants is planned for early 2022. Workshop objectives are proposed to focus on: 1) launching a dialogue that will improve ties between the AC PPS and SAON, and 2) improving understanding of the goals of the AC PPs and both SAON and the SAON ROADS process. Participation is being sought from across the AC PPs and the SAON Executive.

Joint Statement of Ministers on the Occasion of the Third Arctic Science Ministerial[4] (excerpt)

Observe: implementing observing networks; data-sharing

Reliable data about changes in the Arctic are more limited than for most other parts of the planet. Vast gaps of in situ data in the Arctic remain, and there are limited long-term and space-based observations. In addition, foundational geospatial mapping is a fundamental input to a better understanding of Arctic ocean and coastal ecosystems, but much of the Arctic is not surveyed or is inadequately mapped. As observations of a wide range of variables (such as wildlife, atmosphere, water, land, ice, snow, coastlines, oceans, as well as of social, cultural, and economic impacts) are required from a variety of observation platforms (such as marine, surface, upper air, and space-based), sustaining long-term in situ observation systems in the Arctic is demanding and requires considerable human and financial resources. International commitment is required to sustain critical pan-Arctic observation infrastructure, ocean and coastal mapping, a high level of coordinated campaign observations, and a focus on data management and sharing. For some observation systems, empowering Indigenous Peoples and other Arctic residents to engage in research and monitoring programmes is important for fostering a localized observing system that includes community-driven observation. The urgency of these actions has become even clearer during the COVID-19 pandemic, apart from satellites and surface networks, which has amplified some of the existing weaknesses in sustaining long-term observational research.

[4] Joint Statement of Ministers on the occasion of the Third Arctic Science: official text: as of May 9, 2021 (Tokyo, Japan). https://asm3.org/library/Files/ASM3_Joint_Statement.pdf (accessed: 10.02.2022).

Proposed Actions

We therefore intend to cooperate through the following actions: Explore opportunities for mapping as well as supporting the implementation of an enhanced observing system for sharing data and results and deepening collaboration among scientists, technical experts, Indigenous Peoples, and other Arctic residents. We recognize the need to support and integrate Indigenous and community-led observations and foster the co-production of knowledge based on their free, prior and informed consent, as appropriate. We recognize the role the Sustaining Arctic Observing Networks (SAON) initiative has already played and acknowledge that supporting implementation mechanisms identified by SAON will continue to generate long-term benefits for strengthening Arctic observation and data systems. We recognize the need for research partnerships to be built on equal respect, with mutually beneficial and transparent protocols for data governance and intellectual property rights built on ethical guidelines as outlined in the International Arctic Science Committee (IASC) Data Statement.

Long-term

Encourage the strengthening and cooperation of existing long-term observation programmes essential to tracking atmosphere, cryosphere, ocean, coasts, terrestrial, social, and ecosystem change and responding to a warming climate, and encourage the expansion into areas and subdisciplines where monitoring is absent to sparse, including through a co-production process in remote communities.

Promote planning for international cooperation in observational efforts to monitor the accelerating changes in the Arctic environment through national and international domain awareness platforms (satellites, stations, community-led observations, vessels, buoys, and other marine technology) through or in partnership with SAON.

Support ongoing efforts from the IASC/SAON-led Arctic Data Committee and others to harmonize data collection and sharing, particularly those working to make Arctic data and metadata more consistent, discoverable, interoperable, ethically open and accessible, and respect the rights of Indigenous Peoples, as applicable, especially with data pertaining to Indigenous Peoples.

Near-term

Strengthen the work of SAON:

Encourage finalizing the Roadmap for Arctic Observing and Data Systems (ROADS) through the coordination and cooperation between national

and international programmes, small and large projects, and infrastructures, and prioritize implementation.

Promote the expansion of the ROADS efforts to also reflect priorities of Indigenous Peoples.

Encourage SAON to update a gap analysis of where Arctic observations are missing and recommend strategies to address priority gaps.

Foster the development and Arctic deployment of new technologies, such as autonomous and interoperable tools for observations, share advances in technology innovation across the Arctic community of interest.

Encourage the inventory of Arctic mapping gaps and develop operational coordination plans to acquire and share new data to support Arctic science and community resilience.

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