



## Article

# Joint Innovative Research Agenda for The Arctic: Programs, Projects, Success Stories

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**Abstract:** In the context of circumpolar international cooperation within the framework of the Joint Innovative Research Agenda, for the development of a systems approach, it is important to use the resources of existing platforms for multi-level mutually beneficial cooperation. The Council of Barents/Euro-Arctic Region and the University of the Arctic are unique examples of interaction and cooperation between the regions of the Arctic states. The Northern Dimension policy is also an important platform for such cooperation between Russia, the European Union, Iceland and Norway. Cross-border cooperation is integral to international relations, which stimulates the sustainable development of regions, creates growth points for innovative projects, and is focused on the evolution of international economic relationship. Universities and research institutes, as holders of expertise, and centers for studying good world practices and transferring excellence, occupy leading positions in the development of advanced ecosystems and the use of complex technologies, the training of highly qualified personnel for the Arctic, the creating of end-to-end digital technologies, the transforming of priority sectors of the states' economies, and in the social sphere. This article discusses international project activities as one of the most effective tools contributing to the development of these issues. The authors provide examples of successful practices aimed at solving common challenges in the Arctic region, and conclude that "Arctic fever", and the intensification of Arctic scientific partnerships through programs to support the introduction of technologies and innovations and the advancement of scientific stations in the Arctic, directly affect the development of local territories, give impetus to economic progress, and create new models of cooperation.

**Keywords:** international cooperation; international project activities; cross-border cooperation; Arctic region; Research Agenda; innovation; development of territories

## 1. Introduction

One of the most significant documents on international cooperation within the framework of the Joint Innovative Research Agenda is the Agreement on Enhancing International Arctic Scientific Cooperation, signed at the Fairbanks Ministerial meeting on 11 May 2017. This has been ratified by all eight Arctic countries (USA, Canada, Denmark, Iceland, Norway, Sweden, Finland and Russia). The purpose of the Agreement is to expand cooperation in scientific activities to improve the efficiency and effectiveness of the development of

scientific knowledge about the Arctic. Key elements in increased collaboration include the availability of research areas, infrastructure, equipment and data, as well as education, practical training, and the movement of researchers between countries/regions.

The Strategy for Developing the Russian Arctic Zone and Ensuring National Security until 2035 [1] defines international relations as one of the priorities for the development of the Arctic territory. The Arctic is a space for international dialogue and cooperation, a zone of coinciding scientific interests of the Arctic states, and its mindful development should be carried out in close cooperation with foreign partners. The orientation of the world agenda towards solving problems associated with global challenges leads to the need to strengthen cooperation between participants in scientific and technological processes from different countries of the world. Global challenges to humanity, such as climate change, the sustainable development of territories, and the pollution of the world's oceans, are an integral part of the current agenda of the Arctic region. This is reflected in the recently adopted Arctic Council Strategic Plan 2021 to 2030. The fight against global challenges requires the search for and implementation of new scientific and technological solutions through the development of close cooperation between the Arctic countries in different regional formats, including joint project activities; the format of project work is the most successful tool for combining the efforts of the scientific community, business and government.

Cross-border cooperation is an important component of international relations, as this stimulates the integrated and sustainable development of regions, creates growth points for innovative projects, and is focused on the active development of international economic relations. In 2020, the Government of the Russian Federation approved the Concept of Cross-Border Cooperation in the Russian Federation [2]. Strategic objectives for the modernization and innovative development of the Russian economy in the near future are implemented as the main goals of the concept, including joint investment projects, the creation of cross-border industrial clusters, and the development of international transport corridors and the infrastructure potential of border areas. As key measures to stimulate the development of cooperation, the concept defines the development and participation of regions in programs of cross-border cooperation with foreign states or their associations, while ensuring joint funding, including from the federal budget of the Russian Federation [2].

According to the priorities of the Strategy for Developing the Russian Arctic Zone until 2035, the Joint Innovative Research Agenda considers the following measures as trends in international cooperation in science, innovations and technologies, aiming at increasing activities for conducting fundamental and applied scientific research in the interests of Arctic development:

- The development of technologies that are critically important, including the creation of new functional and structural materials necessary for carrying out economic activities in Arctic conditions, the development of land vehicles and aviation equipment to work in the natural and climatic conditions of the Arctic, and the development of technologies for preserving health and increasing the life expectancy of the population of the Arctic zone;
- Conducting comprehensive expeditionary research in the Arctic Ocean (including bathymetric and gravimetric work, acoustic profiling), performing hydrographic research to ensure the safety of navigation, as well as long-term hydrographic research, including deep-sea research, in order to study the underwater environment;
- The development of a comprehensive plan for international scientific research (including expeditionary ones) of the state of the Arctic ecosystems, global climatic changes, and the study of the Arctic [1,3].

International projects are recognized as one of the most effective forms of strengthening international (Arctic) scientific cooperation, and are a tool for integration into the global space. They hold significant potential for the development of new, and the support of existing, technologies that will help in the development of regions through a network of

multi-level cooperation (international, cross-country, national, regional, municipal levels) as well as multi-actor cooperation (scientific community, business, government, nonprofit organizations, etc.).

Our Research Agenda is a wide-ranging concept. The article is devoted to projects implemented within the framework of the European Union and the Nordic countries in the Barents Euro-Arctic region. These projects are of an applied nature, and are aimed at introducing or developing technological solutions in the interests of developing the territories of the Far North.

In the context of “Arctic fever” (the intensification of the Arctic scientific partnership, circumpolar international cooperation within the framework of the Joint Innovative Research Agenda and the implementation of international projects), for the development of a systematic approach, it is necessary to use the resources of existing platforms for multi-level mutually beneficial cooperation.

By constructing an overview of “International cooperation platforms” (The Council of Barents Euro-Arctic region as a unique example of international economic interaction; the University of the Arctic as a network project; the Northern Dimension policies), the authors describe the role of northern universities in fostering innovative technologies, and as providers of research-based expertise and areas for cooperation. The role of cross-border cooperation programs in the development of innovation, examples of successful practices aimed at solving common challenges in the Arctic region, the spin-off effects and the innovation component, are all defined in the part “Success stories: programs and projects”. Finally, the authors propose specific recommendations to expand Arctic research, as well as the availability of support programs to spread technologies and innovations that lead to local growth, economic development and new models for cooperation.

The grant program consists of a large number of small projects. For analytical purposes, and according to the grant program’s priorities, we have clustered them into thematic fields. The effects of the development of Russia’s domestic policy and the geopolitical atmosphere were taken into account. In this regard, the issue of long-term goal achievement has been addressed. When identifying outcomes, we concentrated on effects on cross-border trust and readiness to undertake people-to-people cooperation, since these are the main objectives of the grant program. We considered unintended effects. In some cases, these may be positive, e.g., by inspiring other actors than those involved in the project to initiate cross-border cooperation. In other cases, the unintended effects can be negative, for example, causing distrust due to misunderstandings or poor adaptation to the context.

The practical significance of the results of the article is especially relevant in the framework of the 2021–2023 Russian Chairmanship of the Arctic Council. The Russian Chairmanship will continue supporting the establishment of international Arctic cooperation, improving its work, as well as developing mechanisms for financing the Council’s activities, including its projects and programs, while implementing decisions and recommendations. Among the priorities of the Russian Chairmanship is promoting international scientific cooperation [4].

## 2. International Cooperation Platforms

The Barents/Euro-Arctic Region (BEAR) is a unique example of foreign economic interaction, cooperation between parts of the Arctic states, which are a union of regions and countries that are very different in terms of economic and social development, but have a certain commonality, and can together be considered as a separate economic and geographical region of the world. BEAR is a territory adjacent to the Barents Sea, which includes provinces of Norway (Nordland, Troms, Finnmark); municipalities of Sweden (Västerbotten and Norrbotten); provinces of Finland (Lapland, Northern Ostrobothnia and Kainuu); and regions of Russia (Murmansk and Arkhangelsk oblasts, Republic of Komi and Karelia, Nenets Autonomous Okrug). The territory of the region is 1.75 million km<sup>2</sup>, and the population is over 5 million [5].

The concept of the Barents cooperation was formulated and enshrined by the Kirkenes Declaration of 11 January 1993, bearing in mind the principles and recommendations set out in the Rio Declaration and Agenda 21 of UNCED [6]. The proclaimed goal of cooperation is to promote the sustainable development of BEAR; bilateral and multilateral interaction in the fields of economy, trade, science and technology, environment, infrastructure, education and culture and tourism; as well as the implementation of projects aimed at improving the situation of the indigenous population of the North [7].

The core of the Barents cooperation is the relationship between Norway and Russia, and these countries have played a major role in the creation and subsequent development of the Barents Region. The Norwegian Barents Secretariat is one of the institutions that has ensured the functioning of the Barents Cooperation [8]. Over the years of partnership, hundreds of joint projects have been implemented, international educational programs have been created and are operating, and new partnership formats have been initiated that contribute to the promotion of innovations, action plans and roadmaps in the Barents Region.

A powerful impetus for development and internationalization was given by academic exchange with the northern countries of Europe, which began in the 1990s within the framework of the scientific and educational cooperation of BEAR. Russian universities acted as one of the main subjects of international scientific and technical cooperation, as well as being a channel for knowledge and technology transfer, and the training of scientific personnel in the technologies of the future [9,10].

This was realized through different types of activities: joint educational events, the introduction of innovative technologies in the educational process, the scientific expertise of northern universities, and the implementation of joint projects. Importance is given to the development of international English-language programs with BEAR universities in such priority areas as environmental protection and conservation, resource conservation, information and communication technologies, the sustainable development of the Arctic circumpolar territories, and the tourism and recreation industry in the Arctic.

Examples include the interdisciplinary course “The Changing Arctic” based at the University of Oslo under the project “AwaRE: Arctic Research and Education” and the international project “Arctic Bridge”, in cooperation with the University of Nord (Norway), which study the state of postgraduate education in Russia and Norway and the harmonization of postgraduate programs [9,10]. On an annual basis, young scientists actively participate in courses and competitions organized on the largest platforms for discussing the development of the North and the Arctic in Norway, Finland, Iceland, Canada and other Arctic countries.

The development of skills to work in a research team, with the interpersonal and intercultural communication necessary for barrier-free involvement in the international space and the processes of scientific diplomacy, is relevant. It is worth mentioning the International Youth Forum “Arctic. Made in Russia”, a youth school held within the framework of the Fourth International Forum “The Arctic: Territory of Dialogue” [11]; Barents PhD School—the International summer school for graduate students of the Barents region [12]; the international postgraduate school “Russia in the Arctic Dialogue: local and global context” [13], as well as traditional schools of management of the northern territories, energy efficiency in the Arctic, bioresources of the North, and business practices on sustainable management, ecology, and forestry in the subarctic region.

This training format in the form of short-term educational platforms on topical science subject matters proves to be a successful practice that meets global trends in ensuring the quality of the training of specialists. Thanks to effective cooperation with universities in the Barents region, a critical mass of well-trained specialists with a high level of education, international competencies, flexibility of thinking and experience of intercultural communication has been formed in the northern regions of Russia. Their further involvement as managers in the industrial and business structures of the region, as well as in authorities, universities and international organizations, has contributed significantly to the develop-

ment of the human resources of the region, and also to the strengthening of mechanisms of regional integration and the innovative development of the territory [10].

Over time, the vectors of international cooperation and the geography of academic mobility have begun to expand significantly and exceed the borders of BEAR, which took place in the context of the country's development and its strategic guidelines for increasing the competitiveness of Russian education at the world level, while exporting cooperation.

In the context of circumpolar cooperation, it is necessary to highlight the University of the Arctic [14] network project, created by the Arctic Council in 2001 and having the observer status of this international organization. The University of the Arctic is the largest international network of educational and research institutions (more than 200 organizations from the Arctic and non-Arctic states) conducting scientific and educational activities in the North. The main goal of the consortium is the production of knowledge and scientific potential through the resources of international cooperation to ensure sustainable progress in the circumpolar region and favorable conditions for the northern residents.

The topics of cooperation are extensive, including the development of innovations, the protection and preservation of the environment, planning at the local level, climate change and sustainability, security, construction in northern climatic conditions, renewable energy, education in the North, history and current problems of international relations in the Arctic, health and well-being, and many other aspects.

Among the most significant initiatives in the work of the Research Office of the University of the Arctic in Arkhangelsk [15] are the international project "Global Access to Higher Education in the North", aimed at increasing the attractiveness and promotion of northern universities in the global educational market; an international PhD school "From Lomonosov to Nansen and beyond: energy, infrastructure, transport in the Arctic" (November 2011); the Seventh UArctic Rectors' Forum at NArFU with the participation of the Heads of 28 universities from eight countries (June 2013); an international school "Model Arctic Council" with the participation of undergraduates and postgraduates from the USA, Canada, Norway, Sweden, Great Britain, and Russia (February 2014); the Russian-American project "Natural Disasters in the Arctic" and a similarly named educational course; the international project UCCARP/UArctic Community Consultation on Arctic Research Planning (Canada), aimed at studying the request of the northern territories for scientific research and being an integral part of the international initiative ICARP III; a project to study the needs of academic mobility in the North, "North-to-North Plus"; a project within the framework of the cross-year of Russia and the UK called "Development of the UK—Russia Arctic Research and Collaboration Network" in 2017–2018.

In 2017, with expert support from the Research Office, reports were translated and published in Russian, containing an analysis of global trends in scientific research in the Arctic using bibliometric and other methods. Digital Science, UberResearch, Altmetric and Elsevier Publishing House, which publishes about a quarter of all scientific journals in the world, are partners in this large-scale project in collaboration with the University of the Arctic.

UArctic in cooperation with universities in Sweden (Stockholm University, Royal Institute of Technology, Umeå University), Japan (University of Tokyo), Russia (Northern (Arctic) Federal University) and the USA (University of New Hampshire), and with the support of the Swedish Foundation for International Cooperation in Research and Higher Education STINT in 2019–2020, implemented the project "Arctic Science Integration Quest/ASIAQ" [16]. Project work, including scientific internships, seminars and joint publications, has solved the problem of building a cross-disciplinary scientific partnership at the junction of four areas of knowledge: Arctic engineering, the physical sciences, social sciences, medicine and health care.

In 2020, on the basis of the Research Office, the project "Barents Sea Leadership on Marine Litter" was launched, implemented with the support of GRID-Arendal—the Norwegian Center of Excellence of UNEP (UN Environment Program) and the Ministry of Environment of Norway [17]. An online course on marine litter was launched, targeting



specialized federal, regional and local government officials with the aim of networking to bring together stakeholders working on marine litter in the Norwegian and Russian parts of the Barents Region.

Additionally, a unique platform for multi-level mutually beneficial cooperation between Russia, the European Union, Iceland and Norway is the Northern Dimension Policy, operating within the framework of the activities of four partnerships in the fields of environmental protection, transport and logistics, health and welfare and culture, with further involvement of the Parliamentary Forum, the Business Council and the Northern Dimension Institute.

The Northern Dimension Institute (NDI) brings together more than 30 universities and research organizations in the region, and is an important expert and information platform for this format of international cooperation in northern Europe [18].

A special case of effective cooperation is the interdisciplinary research project “Development of Think Tank Functions of the Northern Dimension Institute”, which was launched in 2019 (supported by the European Commission) [19]. The project involves international teams of experts from Finland, Russia, and Austria, including representatives of Aalto University, NARFU, St. Petersburg State University of Economics, University of Oulu and the International Institute for Applied Systems Analysis. They conduct interdisciplinary research on the development of logistics and ensuring the safety of maritime navigation, environmental protection, cultural innovations, health care and the quality of life of people in the northern regions.

Within the framework of the project, training and expert seminars are organized, focusing on research methodology and issues of interaction between the academic community and government authorities, taking into account the effects of scientific expertise in decision-making processes. The results of the joint scientific work form the basis for recommendations regarding the development of the Northern Dimension partnership policy, and will be presented at the annual Northern Dimension Future Forum.

Thus, the implementation of projects through the prism of the international dimension is an opportunity to expand horizons for solving the problem not only from the point of view of national approaches, but also through a transnational view of the essence of the problem, taking into account the best world practices and the consolidated resources of international partners.

### 3. Success Stories: Programs and Projects

The attention being paid to international projects is due to their key characteristics, such as their focus on a specific result achieved over a certain period of time using attracted grant funding, as well as partnership and cooperation, innovation, and interculturality. Modern challenges, especially concerning the Arctic region, are transnational in nature [20–25]. In this context, international scientific projects are becoming one of the most productive ways to develop scientific partnerships, and are a unifying platform for solving common challenges in the Arctic.

Projects with powerful spin-off effects and an innovative component include those that are implemented within the framework of cross-border cooperation programs.

Cross-border cooperation is one of the most broadly recognized models of cooperation between countries, while being a sustainable dialogue mechanism and a significant research topic. According to the Foreign Policy Concept of the Russian Federation [26], the development of cross-border cooperation between regions is an important component of bilateral relations in the fields of trade and economics, ecology, humanitarianism, and other areas. The concept of cross-border cooperation takes into account accumulated experience, proceeding from the unity and integrity of the territory and the internal market of the Russian Federation, along with the coordination of national interests and the interests of the population of the border territory of the Russian Federation [2]. The priorities of the programs are linked to strategic documents of the Russian Federation.

Cross-border cooperation programs for the northern territories of Finland, Sweden, Norway and the north-west of Russia began to be implemented in 1996 (Barents II A 1996–1999, INTERREG III A North 2000–2004), laying the foundational principles of work on financing projects. According to the report of the interim working group of the Council of the Barents Euro-Arctic Region on the study of financial mechanisms of cooperation in the BEAR [27], at present, the programs of cross-border cooperation “Kolarctic” and “Karelia”, as well as the programs Interreg North, Interreg Baltic Sea Region Program, Northern Periphery and Arctic Program, are of particular importance to international cooperation projects in the region. The Kolarctic program of cross-border cooperation between the EU and Russia is recognized as the most effective instrument of partnership that effectively meets the priorities and fulfils the tasks of the region’s development, while covering the entire territory of the BEAR.

The implementation of the first period of the European Neighborhood and Partnership Instrument “Kolarctic ENPI 2007–2013” program actually started in 2010 with the extension of projects until the end of 2015, with the summing up of the final results at the level of the program region and, in general, the EU cross-border cooperation programs in 2017.

The Kolarctic ENPI program’s area is about 2 million km<sup>2</sup> and includes Lapland (Finland), Norbotten (Sweden), Finnmark, Troms, Nordland (Norway), Murmansk Oblast, Arkhangelsk Oblast and the Nenets Autonomous Okrug (Russia), which are the main applicants in the projects and the recipients of funding. The surrounding areas are Ostrobothnia in Finland, Vesterbotten in Sweden, the Republic of Karelia, the Leningrad Oblast and the city of St. Petersburg in Russia.

The overall goal of the Kolarctic Program is to reduce the periphery of the partner countries’ border regions and related problems, as well as to promote the development of multilateral cross-border cooperation in the Barents Region by strengthening the economic, social and environmental potential of the territories, achieved through the implementation of international projects [28].

In the first program period, three thematic priorities were identified: economic and social development, common challenges, and the interaction between people and the formation of identity [28].

As a result of four project competitions, 51 projects received approval and grant support, of which 48 were standard projects and 3 were large-scale infrastructure projects [29]. In total, 33,420 people from 801 organizations in 12 regions and 202 municipalities of Finland, Norway, Sweden and Russia took part in the program.

The program participants are distributed as follows: most of the participating organizations were government agencies. Among them, the leading role of universities and research institutions in the initiation and implementation of regional development projects should be highlighted. In total, 36 educational institutions and research organizations from the program and adjacent territories took part in the projects (including Russia—16 universities and research institutes, Finland—10, Norway—8, Sweden—2) [30].

The active participation of government bodies of all levels in projects (90 institutions, including 34 institutions from Russia) as applicants and project partners, first of all, indicates the compliance of the program objectives and implemented actions with strategic objectives and road maps for the development of territories and government support for cross-border cooperation. The active involvement of representatives of authorities at different levels is one of the key factors in the success of projects, ensuring the implementation of the achieved results and their further financial and organizational stability, which is confirmed by the results of the three large-scale projects aimed at the infrastructural development of the Russian program area. The attracted investments, totaling about EUR 31.9 million, made it possible to reconstruct the automobile border crossing point of Borisoglebsk in the Murmansk Oblast (the highway connecting Kandalaksha and Alakurtti with the Salla BCP), and to transfer the energy supply system of the Nenets Autonomous Okrug from hydrocarbon fuel to local alternative electric energy sources [31].

The following project initiatives in the field of innovation development, in which partners from the Arkhangelsk Oblast took part, can be cited as successful projects. Within the framework of the project “The Atlantic Salmon in the Barents Region”, the Arkhangelsk scientists of the Northern Branch of the Polar Research Institute of Marine Fisheries and Oceanography, named after N.M. Knipovich (Research Institute “SevPINRO”), together with scientists from three countries collected genetic data on the salmon population in the Barents and White Seas, which made it possible to create a unique genetic map of the northern salmon populations and their migration patterns, as well as to develop recommendations on the most rational and scientifically based management of salmon resources in the Barents region [31].

Among the main socio-economic effects of the two implemented transport projects “Safer Roads for Users” and “Barents Freeway” (lead partner—Avtodorkonsulting LLC) is the creation of a risk management model in areas where road accidents are concentrated, the assessment of opportunities and proposals for the development of roadside service infrastructure, which can inform users and provide assistance to victims of road accidents at the cross-border road [31]. In addition to achieving the main goal of the project, mechanisms for long-term interaction between the actors were formed, which made it possible not only to implement further joint initiatives to develop the achieved results, but also to solve systemic problems at the regional, interregional and interstate levels within the framework of the integrated strategy for the development of the BEAR transport system developed by the partners.

Building intercultural networks and working with information “at the intersection of cultures” created a platform for gaining valuable experience of intercultural interaction. Projects with the participation of the Ministry of Culture of the Arkhangelsk Oblast and the Arkhangelsk Museum of Local Lore brought together regional museums and more than 70 craftsmen from 11 districts of the Arkhangelsk Oblast to analyze the modern development of craft traditions in the region; to find innovative approaches in order to preserve cultural traditions; and to improve cultural management and entrepreneurship in the field of creative industries, taking into account the experience of Scandinavian partners [32].

The “Barents Cross-Border University (BCBU+) Development Project” (2011–2013) [33] contributed to the development and launching of an integrated master’s program “Information Technology in Medicine and Social Sphere”, and participated in the promotion of university education to meet the needs of the Barents Euro-Arctic region in the training of highly qualified specialists and the development of guidelines for the creation of a virtual cross-border campus in the BCBU network.

The team of the project “CETIA: Coastal Environment, Technology and Innovation in the Arctic” (2011–2014) [34] carried out the integrated monitoring of coastal areas in order to create and implement new technological approaches to bioremediation. A joint master’s program in Environmental Management in the Arctic was developed, as well as a master’s program in Environmental Risk Management in the Arctic.

As a result of the implementation of the project “ArctiChildren InNet ENPI—Empowering School e-Health Model in the Barents Region” (2012–2015), a specialized web platform for monitoring students in pilot schools was created, and research papers on the topic of children’s health in the Barents Region were published [35].

The analysis of participation of the Arkhangelsk Oblast in the Kolarctic program in 2010–2015 showed that international project cooperation with partners from the Barents region brought concrete results, contributing to a more effective solution of economic, transportation and social problems in the region, as well as strengthening international cooperation in the Barents region. The attracted resources made it possible to introduce innovative technologies and methods, improve social infrastructure, continue the transfer of knowledge and develop the knowledge-intensive cluster of the region, expanding the contact and mutual understanding between people. Scientific and educational institutions of the region and organizations from various fields of activity demonstrated their readiness



for cooperation, as well as a high level of competence in international project management and communication in a cross-cultural space. As a result of the projects, platforms for network partnership were created through the combination of business, government agencies, NGOs and authorities, both at the local level and at the level of the Northwestern Federal District and BEAR.

Currently, the second period of the European Neighborhood Instrument program “ENI Kolarctic 2014–2020” is being implemented, with total funding of EUR 66.3 million (including EUR 12.4 million from the Russian Federation). As a result of competitions, 187 applications were submitted, of which 45 projects were approved for funding [36].

The basis of the joint cross-border development strategy of the Kolarctic CBC Programme is the geographical position. Most of the program’s area is in the Arctic or in the subarctic climate zone. The entire area is characterized by large uninhabited stretches of wilderness and unspoiled nature. Most of it belongs to the boreal coniferous forest zone, with tundra in the northern parts.

Certain new (unlike the previous competition) specific program’s objectives include the “viability of the arctic economy, nature and environment” and the “fluent mobility of people, goods and knowledge”. The program (2014–2020) contributes to the needs of the area identified in the priority axes by supporting projects with the following thematic objectives: business and SME development, environmental protection, climate change adaptation and mitigation, improvement of accessibility to the regions, development of sustainable and climate-proof transport and communication networks and systems, promotion of border management and border security, and mobility and migration management. The promotion of local cross-border people-to-people actions and support for education, research, technological development and innovation are considered as horizontal modalities. Cross-cutting issues, in particular environmental sustainability and gender equality, will be promoted throughout the program’s implementation [36].

The objective of the Kolarctic ENPI CBC (2007–2013) Programme is to support the periphery of the countries’ border regions and reduce related problems, as well as to promote multilateral cross-border cooperation [27].

As regards projects with the participation of partner organizations of the Arkhangelsk Oblast, a number of technological projects aimed at introducing innovations and the transfer of expertise, which are attracting breakthrough IT technologies (blockchain, artificial intelligence, internet of things) to the region in order to develop knowledge-intensive clusters and key industries in the region, are being supported.

Examples of innovative projects that have united partners of the northern regions in the implementation of digital technologies for the needs of the regions include “I2P: From Idea to 3D Printing”, “Disruptive Information Technologies for Barents Euro-Arctic Region”, and “Ice Operations”.

The project “I2P: From Idea to Printing of Metal Products” is being implemented (2019–2022) and is aimed at developing the innovative industry of 3D printing on metal, as well as the potential of small- and medium-sized enterprises to use the latest additive manufacturing technologies and the scientific and practical capabilities of universities and their laboratories. Partners of the project include the Luleå University of Technology (lead partner) (Sweden), NArFU (Russia), University of Oulu (Finland) and University of Tromsø—Arctic University of Norway [37].

As part of the first year of the project’s implementation in 2020, an economic assessment was carried out of specialized enterprises in the Russian regions of the Kolarctic programs (Arkhangelsk Oblasts, Murmansk Oblasts and NAO), potentially focusing on the introduction of innovative technologies, mapping the local manufacturing industry, and questioning business companies in the regions, with the aim of the further assessment of manufacturing capabilities for the use of 3D printing technologies. International webinars and cyberlabs focused on additive manufacturing technologies for metal products were held. In October 2020, together with the Luleå University of Technology, a “Metal Additive Manufacturing Webinar and Cyberlab” was organized with the participation of about

40 representatives of universities and business companies in Sweden, Finland, Norway and Russia. A new collaboration platform for cooperation within BEAR in the field of additive technologies in industrial production was created: samples for experiments using a 3D printer were selected, the obtained samples were tested, and production capabilities were assessed. Experts from the NArFU and Luleå University of Technology created the specialist web portal [www.i2metprint.com](http://www.i2metprint.com) (accessed on 20 July 2021). Users of this resource will have access to the experiences of modern industrial companies.

“The Disruptive Information Technologies for Barents Euro-Arctic Region (DIT4BEARs)” project, which is being implemented in the period 2020–2022, involves partners from all four countries in the program: Luleå University of Technology (lead partner) (Sweden), NArFU, St. Petersburg National Research University of Information Technologies, Mechanics and Optics (Russia), University of Tromsø—Arctic University of Norway, Lapland University of Applied Sciences (Finland), and the non-profit partnership of software developers RUSSOFT [38].

The project implements a scientific and technological partnership, as well as technology exchange, and develops innovative IT solutions to address the common challenges experienced by the Nordic partner countries in the following areas:

- SmartID—development of a system for the personal identification of citizens based on blockchain technologies in the state and municipal services;
- SmartWaste—development of a smart waste management system in northern municipalities;
- SmartRoad—solving the problem of winter road maintenance in the Barents region, associated with unstable weather conditions;
- ConnectedDeer—development of IT services in the field of reindeer husbandry (IT monitoring, GPS information, ensuring the safety of keeping animals).

Technology transfer is carried out via a concept created by partners, called Living Laboratory, which represents an open international innovation ecosystem focused on representatives of business, municipalities, universities and other stakeholders, seeking to take advantage of new opportunities associated with disruptive information technology. The work of the laboratory includes conducting scientific research, organizing hackathons and schools, and providing international expert support at the request of companies.

As an example, in 2020, they organized the international online hackathon “Smart Solutions for the North”, designed to facilitate the transfer of information technologies. For 36 h, the hackathon participants solved problems experienced by companies from Russia, Finland, Sweden and Norway related to electronic identification based on blockchain technology, digital technologies in the forest industry, smart garbage collection, transport security and reindeer husbandry. Thirteen teams from various universities took part in the hackathon and presented specific solutions to the problems of the companies.

The IT technologies used in ice modeling in the North Sea are used in the research project “Ice Operations: Ice Management in the Barents Sea”, implemented by an international consortium uniting the large research center SINTEF Narvik A.S. (Norway) (lead partner), NArFU, Luleå University of Technology, the Finnish Meteorological Institute, Maritimt Forum Nord, Storvik & Co OY, and the Sozvezdiye Oil and Gas Suppliers Association [39]. The project has a common goal—to promote the industrial development of the Arctic territories. An international team of scientists from four countries is working on the tasks of accumulating knowledge and collecting data on ice conditions in the northern seas, developing and improving navigable accessibility and predictive mathematical models of ice conditions to ensure industrial and environmental safety during field development. They are working on recommendations for the oil and gas industry and an expert assessment of specific cases of companies. The formation of a database on risk assessment in the Barents Sea in the context of the requirements of the Polar Code will improve the safety of maritime transport.

The international project “DeConcrete/Eco-Efficient Arctic Technologies Cooperation” is addressing the problems of international scientific research to develop new technological

approaches for the recycling and environmentally friendly use of waste concrete in the Arctic [40]. NArFU is the leading partner of the international research alliance amongst the University of Tromsø—the Arctic University of Norway, the Norwegian Research Institute SINTEF, the University of Oulu (Finland) and the Norwegian Cluster for Reinforced Concrete, of which 34 Norwegian organizations are members. The project implementation period is 2019–2022. Scientists are solving the problem of finding the most relevant physical and chemical characteristics related to the dismantling, separation and reuse of concrete waste even before the stage of destruction of concrete structures. The sampling of used concrete fractions was carried out in the countries participating in the project; parallel comparative studies are being carried out. To conduct research in NArFU, a unique piece of equipment was purchased—a thermal analyzer SDT650+, which allows for conducting research on the physicochemical and chemical transformations occurring in secondary crushed concrete, the screening of concrete crushing, the identification of individual minerals and the determination of their quantitative contents in concrete, and research into the mechanisms and speeds of changes occurring in concrete. This thermal analyzer, when combined with the already existing unique scientific installation “Physical Chemistry of Surfaces of Nano-Dispersed Systems”, made it possible to create the only analytical system in Russia for solving problems of this kind. Laboratory studies were carried out on the use of the smallest fractions (cement-concrete dust), which allowed for creating a waste-free product. Possible areas for the most efficient reuse of concrete structures are being studied together with regional business, and recommendations are being developed. Based on the results of the research carried out in collaboration with foreign scientists, eight scientific articles were prepared and published. This program became one of 15 projects selected for participation in the international exhibition “Innovations across Borders”, demonstrating the potential of international projects and their contributions to business development in the Barents Region (Oulu, 21–25 September 2020), along with the EU cross-border cooperation programs “Kolarctic” and “Karelia”, and the Russian programs “Interreg. Baltic Sea Region”, “Interreg Nord”, and “Northern Periphery and the Arctic”.

Within the framework of the international project of the Kolarctic program “FAMARB: Facility Management of Residential Buildings in the Barents Region”, energy efficiency and energy saving technologies are being investigated and implemented in the interaction of the industrial sectors of Scandinavian countries and northern Russia [41].

An international scientific alliance, represented by the University of Tromsø—the Arctic University of Norway, NArFU, the University of Applied Sciences (Oulu), and the Swedish Research Institute, is working on the development of models for the energy-efficient management, operation and maintenance of construction projects. The results of scientific research in Norway, Finland, and Russia are being successfully implemented in practice: using the example of a demonstration performed by NArFU, scientists have proven the effectiveness of using the latest technologies for managing camp accommodation facilities in conjunction with the architectural features of buildings. Scandinavian technologies for the energy optimization, operation and maintenance of construction facilities, as well as possible ways to reduce the impact on the environment, have been studied and implemented at the NArFU demo facility. Experts monitor the microclimatic parameters of the premises on an ongoing basis, with subsequent technical optimizations to achieve the most favorable microclimate with minimal energy consumption, creating opportunities for international business and cooperation between enterprises.

The issues of the efficient use of forest resources of the North, including non-timber resources, were actively addressed within the framework of the project “AgroFore: Agroforestry in Barents Region” in cooperation with partners from Finland, Russia and Norway, represented by the Lapland University of Applied Sciences, Finnish Institute of Natural Resources, NArFU, and Norwegian Institute for Bioeconomic Research. Key thematic blocks of the project work included the development of agroforestry in the North through the introduction of agroforestry practices that combined agricultural and forestry technologies and options for the multipurpose use of biological resources [42].

The experts analyzed the historical and modern aspects of agroforestry in the Barents region, presented forecast calculations of the yield of berries, considered the issues of the economic accessibility of wild plants, analyzed the forest management practices of assessments, and conducted a study of the dynamics of post-agrogenic lands, regarding the possibilities of their use for agroforestry purposes.

Research results on the development of agroforestry practices in northern Europe were presented at the international Arctic Resilience Forum 2020, organized by the Working Group on Sustainable Development of the Arctic Council, chaired by Iceland.

“The Northern Axis-Barents Link” project contributes to the development of activities to address transport challenges in the region and the implementation of the tasks of the joint transport plan of BEAR, paying special attention to the current priority area—studying the potential of the main transport infrastructure of the border regions in the transport corridor “Northern Axis—Barents Link”, and in particular, the use of a new direct federal road connection between Vartius/Lutta (checkpoint on the border of the EU and the Russian Federation) and Arkhangelsk and the construction of a road between the Nenets Autonomous Okrug (Nes village) and the Arkhangelsk Oblast (Mezen) [43]. Technological solutions include increasing the availability and quality of transport infrastructure, taking into account the need to develop energy supply systems and expand the use of renewable energy sources in the North. Experience shows that for some regions of Russia, wind energy is the only energy resource available for the population of remote areas, but the economic assessment indicates high costs and long payback periods. In this regard, the topical issue of the applicability of wind energy for remote northern territories and the assessment of economic efficiency for the needs of the Northern Sea Route will be separately studied within the framework of the project.

In general, the Kolarctic program gave a new impetus to cooperation in the North and made it possible to organize it at a qualitatively new level, on both interregional and interstate scales. The contribution of this tool to the development of border areas is obvious and is of particular relevance in the current geopolitical situation, and it has a great potential.

#### 4. Other Cases

It is necessary to note another important support tool aimed at stimulating the development of science and its innovative component on the part of the Russian Federation through the implementation of projects of an interdisciplinary and international nature, uniting scientists of different academic fields from leading Russian and foreign centers: the so-called “mega grants”.

NArFU was one of the winners in the fifth round of the mega-grant competition. As a result, in 2017, a grant from the government of the Russian Federation, given on a competitive basis for the state support of scientific research conducted under the guidance of leading scientists in Russian educational institutions of higher professional education, was allocated to establish the Arctic Biomonitoring Laboratory at NArFU. The main direction of its scientific research is the development of a methodology for monitoring, assessing, predicting and preventing risks associated with the transfer of highly toxic pollutants via biological pathways that can accumulate in food chains and spread throughout Arctic ecosystems [44]. The work in the laboratory is carried out under the scientific supervision of Ingvar Thomassen, professor at the National Institute of Occupational Health in Oslo (Norway). The project, in addition to solving the main research problems, has become a kind of “workshop” for the training of highly qualified specialists in the field of environmental protection and human health in the Arctic. The analysis of the medical and demographic indicators of the indigenous population was carried out based on the results of studies in the central part of the Arctic zone of the Russian Federation; the choice of optimal ways to reduce the content of toxic substances in raw materials from commercial fish species, traditionally consumed by residents of the Russian Arctic, was made; a modern model for the predictive assessment of risks associated with the harmful effects of persistent toxicants

on the human reproductive system was developed. Confirmation of the competence of the accredited personnel of the Arctic biomonitoring laboratory in the field of the stated research (tests and measurements) was carried out, taking into account the requirements of the interstate standard GOST ISO/IEC 17025-2019.

Biomonitoring is needed to assess the risks of public health disorders and negative demographic implications related to the ingestion of hazardous pollutants into the human body. The consequences of climate change increase the ingestion risks, and the dependence of indigenous peoples on the resources in their environment makes them particularly vulnerable. Hence, the relevance of this issue for Russia and the Arctic countries is obvious and requires attention. The monitoring must be implemented on a regular basis, taking into account not only the effect of pollutants on the body, but also the deficiency of vital trace elements, such as iodine, iron, magnesium, etc., including the chemical analysis of environmental samples, animals and birds, which indigenous peoples consume, as well as human biological samples (urine, blood, breast milk, hair, teeth) [18].

An innovative project that unites young people and researchers from different countries in order to study the Arctic territories, to conduct international multilateral dialogue and compose partnerships in the field of scientific and educational development of the Arctic, and to train personnel, is the scientific and educational expeditionary project “Arctic Floating University”, implemented by NArFU since 2012 [45] in the high latitudes of the Russian part of the Arctic, with the support of the Ministry of Science and Higher Education of the Russian Federation, the Ministry of Natural Resources of the Russian Federation, and the Russian Geographical Society. As part of the field research of the Floating University, data on the transit transfer of ecotoxins along the living chain from fish and poultry to indigenous peoples living in the western sector of the Russian Arctic were obtained. The sources of pollution and their concentrations have been determined. In the course of joint oceanographic research, data on the characteristics of waters have been collected, which makes it possible to study the dynamics of climatic changes in the region and improve ice forecasts for the Arctic seas, and this also contributes to the assessment of marine biological resources. A lot of work has been done to study Arctic avifauna. A combined method of sea and air monitoring of bird populations in the high-latitude Arctic has been developed and successfully tested. Unique data on the species diversity and migration areas of the marine mammals and birds of Vaigach Island, Novaya Zemlya and Franz Josef Land archipelagos have been obtained.

The expeditionary project consists of educational and research modules. The educational program includes a series of lectures, seminars and workshops on a cycle of subjects that form a comprehensive knowledge set of the flora and fauna of the Arctic region among students and graduate students. The research module includes the comprehensive monitoring of the state of the Arctic environment and the study of natural phenomena in the Arctic in the context of global climate change. For the eight years of the project, 13 sea expeditions took place, in which more than 600 people took part. In general, about 300 young scientists and students were trained, including 90 foreign students from 20 countries of the world [45].

A significant contribution to the deepening of cooperation is made by the Norwegian Ministry of Foreign Affairs, which supports international projects, giving impetus to the development of new directions and “innovation zones”.

One of the priority areas of international cooperation in the Arctic is the collaborative work in the field of response to ES. This is important for all Arctic countries. For example, more than 20 organizations from Norway, Russia, Iceland, Denmark and Sweden participated in the project “MARPART: Joint Task Force Management in High North Emergency Response” (2014–2019), supported by the Ministry of Foreign Affairs of Norway. For the first time, an attempt was made to create a scientific basis for the coordination of resources for joint actions in response to emergencies in the Arctic, and an assessment of the organizational structure and system of emergency responses in the Arctic countries participating in the project [46].



The lead partner of the project was Nord University. A long-term forecast of the development of economic activities in the Arctic seas and a risk analysis were presented; an assessment of the organizational structure, forces and means that ensure security in the Arctic countries participating in the project was given; an acquaintance with the systems of organizing emergency responses in different countries was developed. At the second stage, the emphasis was placed on the study and analysis of training systems for future rescue specialists in the national educational systems of the Arctic countries, as well as on the development of recommendations for improving the quality and harmonization of training programs [46].

Within the framework of the project, practical exercises and classes were carried out, through which industry professionals improved their knowledge, skills and competencies. The results of the project have been introduced into educational programs for rescuers and managers on the prevention and elimination of emergencies.

The results of such large international projects also find applicability in the planning of the Barents Rescue international exercise. These initiatives are stipulated by the inter-governmental agreement between the Russian Federation and the Kingdom of Norway on cooperation in the search for missing persons and the rescue of people in distress in the Barents Sea of 4 October 1995 [47].

The importance and necessity of further joint projects in this area, as well as cooperation with emergency services and scientists from leading Arctic world centers, are of great interest, which is also reflected in the strategic document adopted in “2020 Basic Principles of Russian Federation State Policy in the Arctic to 2035”. This document defines one of the main tasks in the development of international cooperation—the assistance in building up the efforts of the Arctic states to create a unified regional system of search and rescue, prevent man-made disasters and eliminate their consequences, as well as coordinate rescue forces.

The issues of international Arctic science are also defined in the Agreement on Enhancing International Arctic Scientific Cooperation within the framework of the activities of the Arctic Council, including the exchange of research data, access to facilities, joint monitoring, the registration of traditional knowledge of the indigenous peoples of the North, etc. [48].

An illustrative example of the “Arctic Fever” collaboration, which combines practices and presents results in the fields of social and natural sciences, was the Jubilee 10th International Congress of Arctic Social Sciences “Arctic Generations: A Look into the Past and the Future” (ICASS) (June 2021), organized by the International Arctic Social Science Association (IASSA/IAASN).

The event was hosted by the Northern (Arctic) Federal University. The congress attracted scientists and experts in social and human sciences to solve the problems of sustainable development in the Arctic, as well as residents of the North, including representatives of indigenous peoples, authorities and non-governmental organizations. More than 800 leading specialists from more than 37 countries of the Arctic region, Central Europe and Southeast Asia were the participants in the Congress. The Congress was the first event within the framework of the Russian Presidency Program in the Arctic Council in 2021–2023.

The International Arctic Science Committee (IASC) is a non-governmental, international scientific organization. The IASC’s instruments, which are used to support science development, include workshops, long-term programs, assessments and science planning activities. The IASC is engaged in all fields of Arctic research, and its main scientific working bodies include five Working Groups: Atmosphere, Cryosphere, Marine, Social and Human and Terrestrial. In today’s world, the IASC not only unites scientists at the international level, but also helps to overcome other, yet more entrenched barriers to opening the way for interdisciplinary research and equitable dialogue between knowledge systems in the Arctic.

## 5. Conclusions

The experience of implementing projects within the BEAR, Northern Dimension, and Nordic countries indicates that the intensity of project work has increased significantly since the last decade of the 20th century, despite the arising of geopolitical contradictions between the Arctic countries. Within the framework of regional formats, mechanisms for the financial support of projects and their evaluation have been successfully implemented. At the same time, in the context of the great Arctic, we observe a situation of sufficiently limited opportunities for the implementation of large applied and fundamental projects, due to the fact that there are no developed financial instruments for the implementation of multilateral international projects within the framework of the Arctic Council. Most of the initiatives have so far been implemented within the framework of bilateral agreements, and the format of the framework region, unfortunately, excludes most of the non-Arctic countries interested in scientific, innovative and research activities in the Arctic from this cooperation. Therefore, it is important to create and develop financial instruments in the format of large multilateral grant framework programs under the guidance of the Arctic Council and the Arctic Economic Council. Moreover, in 2017, an Agreement on Enhancing International Arctic Scientific Cooperation was signed, the implementation of which largely depends on the common efforts of the Arctic countries to create and develop tools to support joint scientific activities in the Arctic.

In addition to the international legal framework that is necessary to its practical implementation, the Arctic region has a strong expert community represented by the working groups of the Arctic Council, the University of the Arctic, the Association of Social Arctic Sciences, the International Arctic Scientific Committee, and other organizations that are actively involved in the formation of a common Arctic scientific agenda, and which are ready to act as an expert community for the formation and subsequent assessment of the results of large-framework research programs in the Arctic.

Summing up, the authors can conclude that “Arctic fever”, the intensification of the Arctic scientific partnership through programs to support the introduction of technologies and innovations, as well as scientific stations in the Arctic latitudes, directly affects the development of local territories, gives an impetus to economic growth, and creates new models of cooperation.

International project activity, due to its integrity and multiplicity of effects (the so-called phenomenon of “circles on the water”, spin-off effect) makes a significant contribution to the development of scientific research and innovation.

In the context of the openness and expansion of the boundaries of the intellectual labor market, internationalization and international scientific and technical cooperation are becoming decisive factors in the preparation of a new type of labor force, and are the most highly desired instruments in the context of circumpolar international cooperation and the development of a systematic approach through existing platforms of multi-level, mutually beneficial partnerships.

Leading positions in the development of advanced ecosystems and the implementation of advanced technologies, including ensuring the training of highly qualified personnel for the Arctic, creating end-to-end digital technologies, and transforming priority sectors of the economy and the social sphere, are occupied by universities and research institutes as holders of expertise and centers for studying the best practices. These also offer the best experience for startups.

Involvement in the global intellectual space gives young scientists access to the world “frontier” of knowledge and foreign research resources, allowing them to gain experience in international cooperation, and to develop skills related to working in an international research team, thereby contributing to the professional growth of a young scientist.

The assistance and encouragement of the integration of young researchers into the global community of scientists will contribute to the building of human potential and the formation of qualitatively new labor resources in order to increase the intellectual promise of the country.

Along with the presented effective practices, for further international scientific cooperation, it is necessary to develop effective measures of state support, new programs and forms of scientific and educational partnership for young personnel, new mechanisms for the development of exchange programs for young scientists, and institutional and material infrastructure for international research and development.

The regional specificity of cooperation in the Arctic region necessitates the solution of important issues of grant support related to scientific cooperation, such as the academic mobility of undergraduates and graduate students to geographically remote northern partner universities and the organization of joint field research trips and expeditions that require significant financial and organizational resources. Investments in the development of scientific stations in high latitudes for field research and the intensification of Arctic scientific partnerships, as well as in various formats of collaboration for young scientists in the North, are very important.

The integration of young researchers into the global community of scientists will contribute to the growth of human resources and the formation of qualitatively new labor resources in order to increase the intellectual potential of the country.

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## References

1. Decree of the President of the Russian Federation of 26 October 2020, no. 645 “On the Strategy for Developing the Arctic Russian Zone and Ensuring National Security until 2035”. Available online: <http://static.kremlin.ru/media/events/files/ru/J8FhckYOPAQQfxN6Xlt6ti6XzpTVAvQy.pdf> (accessed on 25 June 2021). (In Russian).
2. Order of the Government of the Russian Federation of 7 October 2020 no. 2577-r “Concept of cross-Border Cooperation in the Russian Federation”. Available online: <http://static.government.ru/media/files/MnASiQeMZvg94D1jToaVcdAyXzgFpGAC.pdf> (accessed on 25 June 2021). (In Russian)
3. Kudryashova, E.V.; Lipina, S.A.; Zaikov, K.S.; Bocharova, L.K.; Lipina, A.V.; Kuprikov, M.Y.; Kuprikov, N.M. Arctic zone of the Russian Federation: Development problems and new management philosophy. *Polar J.* **2019**, *9*, 445–458. [CrossRef]
4. Arctic Council. Russian Chairmanship 2021–2023. Available online: <https://arctic-council.org/about/russian-chairmanship-2/> (accessed on 20 July 2021).
5. The Barentsinfo Portal. The Barents Region. Available online: <https://www.barentsinfo.org/Barents-region> (accessed on 25 June 2021).
6. UNCED. Agenda 21. Available online: <https://sustainabledevelopment.un.org/outcomedocuments/agenda21> (accessed on 20 July 2021).
7. Ministry of Foreign Affairs of the Russian Federation. Barents/Euro-Arctic Region Council Basic Directions of Cooperation (Reference Information). Available online: [https://www.mid.ru/diverse/-/asset\\_publisher/zwl2FuDbHjx9/content/barencev-regional-nyj-sovet-spravocnaa-informacia-](https://www.mid.ru/diverse/-/asset_publisher/zwl2FuDbHjx9/content/barencev-regional-nyj-sovet-spravocnaa-informacia-) (accessed on 30 June 2021). (In Russian)
8. The Norwegian Barents Secretariat. History. Available online: <https://barents.no/ru/o-sekretariate/istoria> (accessed on 30 June 2021). (In Russian)
9. Avdonina, N.S.; Tamitskiy, A.M.; Zaikov, K.S. The Seventh International Forum: “The Arctic: Present and Future: Perspectives and Actions”. *Polar J.* **2018**, *8*, 213–215. [CrossRef]
10. Kudryashova, E.V.; Zarubina, L.A. International cooperation as factor of formation of intellectual potential in the North. *Alma mater* **2019**, *11*, 23–29. [CrossRef]
11. The International Youth Educational Forum. “Arctic Made in Russia”. Available online: <https://fadm.gov.ru/activity/events/arctic> (accessed on 30 June 2021).

12. Barents PhD Summer School Arkhangelsk 20–26 August. Available online: [https://narfu.ru/en/studies/barents\\_phd/](https://narfu.ru/en/studies/barents_phd/) (accessed on 25 June 2021).
13. Russia in the Arctic Dialogue. Available online: <https://narfu.ru/en/studies/arcticschool-2019> (accessed on 25 June 2021).
14. The University of the Arctic (UArctic). Available online: <https://www.uarctic.org/> (accessed on 25 June 2021).
15. UArctic Research Office in Arkhangelsk. Available online: [https://narfu.ru/international/university\\_arctic\\_research/](https://narfu.ru/international/university_arctic_research/) (accessed on 25 June 2021). (In Russian)
16. Official Site of the ASIAQ Project. Available online: <https://asiaq.org/> (accessed on 25 June 2021).
17. Project “Barents Sea Leadership Training on Marine Litter”. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=343955](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=343955) (accessed on 27 June 2021).
18. The Official Internet Portal of the Northern Dimension. “Systemic Biomonitoring Needed to Mitigate Arctic Health Risks”. Available online: [https://northerndimension.info/wp-content/uploads/2019/12/NARFU\\_Arctic\\_biomonitoring\\_final.pdf](https://northerndimension.info/wp-content/uploads/2019/12/NARFU_Arctic_biomonitoring_final.pdf) (accessed on 27 June 2021).
19. NDI Think Tank Project. Available online: <https://northerndimension.info/ndi-think-tank-action-launched/> (accessed on 27 June 2021).
20. Gorokhov, A.M.; Zaikov, K.S.; Kondratov, N.A.; Kuprikov, M.Y.; Kuprikov, N.M.; Tamitskiy, A.M. Analysis of scientific and educational space of the Arctic zone of the Russian Federation and its contribution to social and economic development. *Eur. J. Contemp. Educ.* **2018**, *7*, 485–497. [CrossRef]
21. Kudryashova, E.V.; Zarubina, L.A.; Popkova, S.V.; Baykina, N.V. Potential of International Project Activity for University Development. *Vyshee Obraz. v Ross. = High. Educ. Russ.* **2020**, *29*, 125–134. [CrossRef]
22. Lipina, S.A.; Zaykov, K.S.; Lipina, S.V. Introduction of innovation technology as a factor in environmental modernization in Russian Arctic. *Econ. Soc. Chang. Facts Trends Forecast* **2017**, *10*, 164–180. [CrossRef]
23. Zaykov, K.S.; Kalinina, M.R.; Kondratov, N.A.; Tamitskiy, A.M. Innovation course of economic development in the Northern and Arctic territories in Russia and in the Nordic countries. *Econ. Soc. Chang. Facts Trends Forecast* **2017**, *10*, 59–77. [CrossRef]
24. Zaykov, K.S.; Kalinina, M.R.; Tamitskiy, A.M.; Saburov, A.A.; Shepelev, E.A. Scientific and educational space of the Arctic: Norway. *Arct. North* **2016**, *23*, 144–170. [CrossRef]
25. Zaykov, K.S.; Maksimov, A.M.; Tamitskiy, A.M.; Troshina, T.I. Ethnosocial situation in Arctic regions of Russia and the State national policy. *Polis (Political Stud.)* **2018**, *2*, 57–67. [CrossRef]
26. Official Website of the Ministry of Foreign Affairs of the Russian Federation. Foreign Policy Concept of the Russian Federation. Approved by the President of the Russian Federation V.V. Putin. 30 November 2016, p. 106. Available online: [http://www.mid.ru/foreign\\_policy/news/-/asset\\_publisher/cKNonkJE02Bw/content/id/2542248](http://www.mid.ru/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/2542248) (accessed on 27 June 2021).
27. Financing of Barents Cooperation. In *Report of the BEAC Ad Hoc Working Group on Financial Mechanism Study*; Ministry for Foreign Affairs of Finland: Helsinki, Finland, 2015. Available online: [https://www.barentsinfo.fi/beac/docs/LOW\\_UM\\_Barents\\_eJulkaisu\\_A5.pdf](https://www.barentsinfo.fi/beac/docs/LOW_UM_Barents_eJulkaisu_A5.pdf) (accessed on 27 June 2021).
28. Joint Operational Programme, ENPI CBC Kolarctic 2007–2013. Available online: <https://www.kolarcticenpi.info> (accessed on 27 June 2021).
29. Myllylä, M.; Cicero, V. *Fiftyone: Information about 51 Kolarctic ENPI CBC Projects*; Lulea Grafiska AB: Lulea, Sweden, 2015.
30. Kudryashova, E.V.; Zarubina, L.A. Cross-border cooperation programmes as a resource of social and economic development of Barents region (case of ENPI Kolarctic programme). *Sovremennaya Evropa* **2019**, *4*, 85–96. [CrossRef]
31. Kudryashova, E.V.; Zarubina, L.A. International projects as a tool of regional development and cooperation enhancement (case of Arkhangelsk region participation in Kolarctic CBC programme). *Vestn. North. (Arct.) Fed. Univ. Ser. Humanit. Soc. Sci.* **2018**, *6*, 88–97. [CrossRef]
32. Garcia-Rosell, J.-C.; Hakkarainen, M.; Koskinen, M.; Paloniemi, P.; Syjala, N.; Tekoniemi-Selkala, T.; Vahakuopus, M. *Barents Tourism Action Plan*; Erweko Oy: Rovaniemi, Finland, 2013.
33. BCBU+: Development of the Barents Cross-Border University. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=26127](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=26127) (accessed on 27 June 2021).
34. CETIA—Coastal Environment, Technology and Innovation in the Arctic. Available online: [https://en.uit.no/prosjekter/prosjekt?p\\_document\\_id=294447](https://en.uit.no/prosjekter/prosjekt?p_document_id=294447) (accessed on 27 June 2021).
35. ArctiChildren InNet: Development of an e-Health System in Schools in the Barents Region. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=31455](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=31455) (accessed on 27 June 2021).
36. Kolarctic CBC Program. Available online: <https://kolarctic.info/> (accessed on 27 June 2021).
37. I2P: From Idea to Printing of Metal Products. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=332977](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=332977) (accessed on 27 June 2021).
38. Disruptive Information Technologies for Barents Euro-Arctic Region. Available online: <http://dit4bears.org/> (accessed on 27 June 2021).
39. Ice Operations. Available online: <http://iceops.eu/> (accessed on 27 June 2021).
40. DeConcrete: Eco-Efficient Arctic Technologies Cooperation (KO 4068). Available online: <https://narfu.ru/deconcrete/> (accessed on 27 June 2021).
41. FAMARB: Facility Management of Residential Buildings in Barents Region. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=294062](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=294062) (accessed on 27 June 2021).

42. AgroFore: Agroforestry in Barents Region. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=294063](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=294063) (accessed on 27 June 2021).
43. Northern Axis-Barents Link. Available online: [https://narfu.ru/international/projects/mezdunarodnie\\_proekti/detail.php?ID=332991](https://narfu.ru/international/projects/mezdunarodnie_proekti/detail.php?ID=332991) (accessed on 27 June 2021).
44. NArFU. Collected Works of International Conference “Biomonitoring in the Arctic”. Available online: <https://narfu.ru/upload/medialibrary/217/5-Sorokina-T.YU.-Biologicheskiiy-monitoring-v-Arktike-kak-mezhdistsiplinarnyy-proekt.pdf> (accessed on 27 June 2021). (In Russian)
45. Avdonina, N.S.; Kudryashova, E.V.; Zaikov, K.S. Terrae Novae: The tenth scientific and educational expedition ‘Arctic floating university’. *Polar J.* **2019**, *9*, 473–475. [CrossRef]
46. Kuznetsova, S.Y.; Zaikov, K.S.; Zarubina, L.A.; Baikina, N.V. The international cooperation on emergency preparedness and response in the Arctic seas: The experience of the Northern (Arctic) federal university named after M.V. Lomonosov. *Arctic Herald—Inf. Anal. J.* **2019**, *2*, 11–17.
47. Agreement between the Government of the Russian Federation and the Government of the Kingdom of Norway on Cooperation in the Search for Missing Persons and Rescue of People in Distress in the Barents Sea of 4 October 1995. Available online: <https://docs.cntd.ru/document/1901171?section=status> (accessed on 20 July 2021). (In Russian)
48. Agreement on Enhancing International Arctic Scientific Cooperation, Signed at the Fairbanks Ministerial Meeting. 11 May 2017. Available online: <https://oaarchive.arctic-council.org/handle/11374/1916> (accessed on 20 July 2021).