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Alignment of interests when exploiting oil and gas resources in the northern territories of the Russian Federation

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Abstract

Research relevance. *Depletion of commercial fuel, energy, and minerals in the developed regions of the country provides for mineral production increase, including oil and gas resources in the Arctic. Exploitation of subsoil resources will again have negative economic, ecological and social effect. The latter includes the effects connected with indigenous small-numbered peoples of the North (ISNPN) living conditions deterioration, which requires finding the possibilities for peaceful coexistence of subsoil users and ISNPN.*

Research aim *is to determine basic negative effects on ISNPN caused by commercial exploitation of arctic territories and substantiate policies the implementation of which promotes the sustainable development of traditional natural resource use and ISNPN.*

Research methodology. *The methods of systematization, factor, comparative and systemic analysis were used during the course of research.*

Research results. *It follows from the characteristic of oil and gas and mining administrative entities of the Arctic zone of the Russian Federation (AZRF) that in recent years the amount of mineral production (oil and condensate, natural gas) grows. Thus, natural gas production in the Yamalo-Nenets Autonomous District in 2018 grew by 7.4% as compared to 2017; oil production grew by 2% at the year end of 2018. The formation of new centers of oil, gas and coal production is predicted, which are currently at the stage of exploration. The growth in the intensity and increasing environmental impact (on the environment and population, including ISNPN) is also natural. Generalization and analysis of experience in oil and gas fields exploitation shows that the most severe conflicts erupt between commercial exploitation of the territory and traditional natural resource use: deer pasture pollution, land withdrawal in favor of industrial and transport construction, etc. Implementation of integrated programs, aimed at ISNPN sustainable development, which put major focus on social and cultural development with no appropriate economic support, does not solve the problem under consideration. The authors propose the policy aimed at the preservation of the "feeding environment" of the natives and their cultural heritage, and taking into account the specific character of the current state of traditional economy and indigenous people engaged in it. The main attention has been focused on the effective use of traditional natural resource use territories, their maintenance within the limits of cultural landscapes, governmental assistance, introduction of ecological-economic estimation of natural capital of the territories of traditional natural resource use (TTNRU) and compensatory payments when damaging biota, considering TTNRU as the components of ecological framework, preservation of cultural heritage of an ethnos. Corresponding scientific investigations may help solving the problem of mutual coexistence.*

Summary. *In order to prevent the negative effects on ISNPN from commercial exploitation of the Arctic, possible conflicts should be predicted and prevented, which will be contributed by the implementation of the authors policy aimed at ISNPN sustainable development.*

Key words: *the Arctic zone of the Russian Federation; commercial exploitation; oil and gas and mineral resources; traditional industries; indigenous small-numbered peoples of the North.*

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Introduction. A key place in the development of the Arctic zone of the Russian Federation (AZRF) is occupied by oil and gas producing and mining subjects – Nenets (NAD) and Yamalo-Nenets (YNAD) Autonomous Districts and polar regions (subregion) of the Krasnoyarsk Krai: the territory of the former Dolgano-Nenets (Taimyr) Autonomous District, which is a municipal district since 2007, Turukhansk municipal district and the municipal formation of Norilsk (table 1).

Table 1. Characteristics of oil and gas and mining administrative entities of the Arctic zone of the Russian Federation (AZRF)

Таблица 1. Характеристика нефтегазовых и горнодобывающих административных образований АЗРФ

Subjects of RF/MF	Area, thousand km^2	Population density, persons/100 km^2	Population, persons, as of 01 January 2019		Share of urban population, %
			total	urban	
NAD	176.8	25	43 829	32 108	73.3
YNAD	769.3	70	541 479	454 254	83.9
Krasnoyarsk Krai	1095.6	21	228 943	207 560	90.7
Taymyr MD	879.9	3.6	31 627	21 487	67.9
Turukhansk MD	211.2	7.4	15 660	4417	28.2
Norilsk MF	4.5	4037	181 656	181 656	100.0
Total	2041.7	40	814 251	693 922	85.2
Share in AZRF, %	55.0	61.5	34.0	32.5	88.9

At the present time (as of January 1st, 2019), the population of oil and gas and mining administrative entities of AZRF is 814.3 thousand people, including 693.2 thousand people in urban settlements, which is 34 and 32.5% correspondingly of their population in AZRF. There are three large (more than 100 thousand citizens) towns at the territory: Norilsk (181.3 thousand people), Novy Urengoy and Noyabrsk (YNAD, 116.9 and 106.1 thousand people correspondingly). There are 7 more towns with the population less than 50 thousand people (except for Salekhard – 50.3 thousand citizens). Large towns are base towns of oil and gas fields and ore deposits exploitation and development. Salekhard, Nadym (YNAD), and Naryan-Mar (NAD) are base towns as well. More than 100 thousand persons of drive-in, drive-out staff, including local residents of the region and residents of other regions of the country, pass through these settlements annually and constitute a significant part of man power engaged in mineral extraction, construction and transport, especially in remote transpolar regions. In addition to the inhabitants of the cities, the inhabitants of workers' settlements also refer to urban citizens; the population of workers' settlements declined significantly in the post-Soviet period.

Major part of population in oil and gas producing Arctic are indigenous small-numbered peoples of the North, the share of which in the rural areas is 42% (table 2).

Rural ethnical population is distinguished by a high share of nomads totaling over 20 thousand people, according to authors' estimates. As at the beginning of 2018 they possessed 1101.7 thousand head of deer. The area of deer pastry is 1025 thousand km^2, which is half the area of these administrative entities.

Industrial potential of the territory, represented by economic entities of oil and gas and mining industries, is based on the world-class deposits (table 3).

The amount of shipped own-produced goods and the amount of works and services domestically performed by the types of economic activity here is 74.4%, and the share of gross regional product of the Arctic zone of the Russian Federation is 72.8%

(including YNAD – about 57%). Mineral production, mainly oil and gas, dominates in the total volume of shipped own-produced goods, with the share of 73%. A special position is occupied by Norilsk, which is home to about a half of (49.8%) process manufactures, 38.2% of work scope performed within the "Construction" type of economic activity and 17.5% of investment into the fixed capital of the Krasnoyarsk Krai.

In 2017, 96.2 million tons of oil were produced in the Arctic, which is 3.8% more than in 2016, and 568.9 billion m^3 of gas (as compared to 2016, growth accounted to 9.6%). Gas output has settled over the last few years, and at the year end of 2017 made up 83% of national output. The share of oil production in the Arctic from 2017 to 2018 increased from 11.8% to 17.6% of national production, and by 2035 this indicator will increase to 26% (*Available from: http://www.cdu.ru/tek_russia/issue/2018/12/545 (accessed 9th August 2019)*). Oil and natural gas production in AZRF is almost completely concentrated within the territory under consideration. In the recent years, excluding NAD, there has been the process of increasing mineral production. Natural gas production thus increased by 7.4% in 2018 in Yamalo-Nenets Autonomous Districts (YNAD) as compared to 2017 and made 601.531 billion m^3. Oil production in YNAD at the year end of 2018 increased by 2% up to 32 million tons. 9.4% increase up to 21.3 million tons has been recorded in gas condensate (*Available from: https://neftegaz.ru/news/dobycha/194217-neft-gaz-i-gazovyy-kondensat-dobycha-uglevodorodnogo-syrya-v-yanao-v-2018-g-zametno-vyrosla (accessed 9th August 2019)). Main mining corporations are PJSC Gazprom (Gazprom Dobycha Llc*), OOO NOVATEK , PJSC Gazprom Neft, Rosneft, etc.

Table 2. The number and share of indigenous peoples of the North in the population of administrative entities of the AZRF

Таблица 2. Численность и доля КМНС в населении административных образований АЗРФ

Subjects of RF/subregion	Rural population, total		ISNPN, village, persons, 2010	Share of ISNPN in rural population, %	ISNPN, persons, 2010	
	2019	2010			total	share of rural population, %
NAD	11 721	13 969	5735	41.9	7504	76.4
YNAD	87 225	79 854	33 901	42.5	41 415	81.9
Krasnoyarsk Krai	21 383	23 113	9317	40.3	11 498	81.0
Total	120 329	116 935	48 953	41.9	60 417	81.0
Share in AZRF, %	45.4	41.8	68.6	151.0	66.7	68.6

In Krasnoyarsk Krai in 2018 extraction made: oil – 24 million tons, condensate – 0.6, total – 24.6 million tons, free gas, including gas caps – 8.062 billion m^3, solution gas – 1404 million m^3 (mining company RN-Vankor Llc). Gas condensate and oil production in Nenets Autonomous District can be estimated at 18 million tons. Oil extraction is carried out by units of LUKOIL-Komi, Nenets oil company, Rosneft, American company ConocoPhillips; natural gas is extracted by Pechorneftegasprom. In general, despite the incremental production of oil and natural gas in YNAD and Krasnoyarsk Krai, extraction value remained at a level of 2017 because the extraction has been reduced in NAD.

Mineral resource base analysis for the north of YNAD – the Kara sea, the Yamal Peninsula, the Gyda Peninsula – makes it possible to divide these territories into two zones. Pipeline transport zone is determined with the account of the existing gas transmission systems and the ones under construction and includes fields of Bovanenkovo group, Yamal shelf, southern Yamal group and fields of the Gulf of OB

and the Taz Bay (the territory adjoining the projected railway of Ob–Salekhard–Novy Urengoy–Korotchaevo, "the Northern Latitudinal Railway"). The zone of LNG (liquefied natural gas) is determined in NOVATEK plans concerning the construction of LNG plants (the territory of the Yamal Peninsula and a part of the Gyda Peninsula, the circles of influence of Yamal LNG, Arctic LNG-2 projects and the Sabetta Seaport) and includes the fields of Tambeisky group of the Yamal Peninsula and the fields of the Gyda Peninsula. Mineral resource base of the zone makes it possible to reach LNG output volume of 90–100 million tons per year. For this purpose, the possibility of building three more LNG plants, in addition to Yamal LNG and Arctic LNG-2, is considered.

Table 3. Production of minerals, shipped goods and gross regional product (GRP)
Таблица 3. Объемы добычи полезных ископаемых (ПИ), отгруженных товаров и валового регионального продукта (ВРП)

Subjects of RF/MF	Production of minerals, 2017		Shipped goods, million rubles, 2017				GRP, million rubles, 2017
	Oil and condensate, million ton	Natural gas, billion m^3	Production of minerals	manufacturing industries	Power and gas supply	Water supply, water discharge	
NAD	20.916	1.120	267 838	21 434	3832	479	276 485.1
YNAD	50.848	560.086	1 911 722	346 799	58 693	10 388	2 461 442.8
Krasnoyarsk Krai	23.276	8.976	439 923	493 457	20 000	6 000	470 578.8
Total	95 040	570.182	2 619 303	861 690	82 525	16 867	3 208 506.7
Share in AZRF, %	99.0	100.0	74.4				73.8

Calculated: Regions of Russia. Social and economic indicators. 2018: statistical handbook. Moscow: Rosstat Publishing; 2018: 591–592, 598–599; Environmental status and protection in Krasnoyarsk krai in 2018: state report. Krasnoyarsk, 2019. Available at: http://www.cdu.ru/tek_russia/issue/2018/12/545/ (Accessed 09 August 2019); http://www.gks.ru/free_doc/new_site/region_stat/calendar1-2019.htm (Accessed 22 April 2019).

The creation of the Taimyr-Turukhansk stronghold in the north of the Krasnoyarsk Krai provides for the development of new points of coal, gas and oil extraction within the arctic territory of the region [1, 2]. Nornickel company already works in the zone. Polar division of the company produces more than 90% of Russian bulk of nickel, more than 40% of copper, 98% of platinum-group metals (PJSC "MMC "Norilsk Nickel" is a world leader in palladium output (40%), with 2% of copper world's output, 12% of nickel, 11% of platinum (2017)). The company is planning to implement projects on ore base expansion. Future development of Krasnoyarsk Krai arctic zone is connected with further development of metallurgy in Norilsk industrial region and new fields of Vankor oil and gas cluster (Suzunsky, Lodochny, and Tagulsky fields). Development of new points of oil, gas and coal production will raise the region's funds for more than 50 billion rub. before 2026. A coal-mining site will be formed on Taimyr with the projected growth of coal production up to 3 million ton per year before 2026. Development of new sites of oil and gas production is at the stage of geological exploration [3]. The first promising site of oil and gas production, Ust Eniseisky, includes Paiyakhskoe and Baikalovskoe fields. Total field reserves are estimated at 200 million tons of oil and 90 billion m^3 of natural gas. The second is Khatangsky site (East Taimyr license area), according to preliminary estimates, keeps 123.5 million tons of oil and 370.6 billion m^3 of gas (*Monitoring of social and economic development of the North and the Arctic.*

Newsletter. The center of the economy of the North and the Arctic. 2017; 4: 2 (on-line version)).

It is oil and gas industry, together with oil and gas processing and ore minerals development, which determine ecological situation of the territory. Accumulated environmental damage of the past also exerts influence on the ecological situation which requires the substantiation of environmental mitigation measures aimed at reducing damage caused by the growth of economic activity in the region [4–8]. He greatest impact into the total output of pollutant emissions (according to the types of economic activities) is made by section "Mining", the share of solid minerals therefore is 67.9% (the main contaminator is the Polar Division of PJSC "MMC "Norilsk Nickel", 1789.3 thousand tons, 2018) (table 4).

Table 4. Emissions of pollutants of oil and gas and mining administrative entities of the AZRF, 2017, thousand tons

Таблица 4. Выбросы загрязняющих веществ нефтегазовых и горнодобывающих административных образований АЗРФ, 2017 г., тыс. т

Subjects of RF/MF	Emissions into the atmosphere of pollutants from stationary sources	Stationary sources pollutants caught and disposed
NAD	100.0	–
YNAD	786.0	0.3
Krasnoyarsk Krai	1920.4	1601.0
Total	2806.4	1601.3
Share in AZRF, %	83.7	45.1

Sources: State report "Environmental status and protection in Krasnoyarsk krai in 2017". Krasnoyarsk; 2018; 35, 38; Regions of Russia. Social and economic indicators. 2018: statistical handbook. Moscow: Rosstat Publishing; 2018: 444–447.

Results. The level of ecological friendliness of the industry and ecological responsibility of oil and gas and mining enterprises condition the quality of the environment: the availability of fresh air and pure drinking water as well as the "health" of ecosystems receiving human impact [8, 9]. Unfortunately, commercial exploitation sometimes has devastating impact on the environment and the communities of indigenous peoples [10–14]. A position of parity in the relationship between the local population and commercial companies, with relation to bilateral consideration of interests, winning development and risks neutralization, has not been achieved yet, however, some ecological investment projects have been developed in national economy and are being implemented by some mining enterprises [15–17 et al.].

The impact of industrialization on the environment and indigenous population causes negative effects of economic, ecological, and social character on the indicated recipients. Economic effect includes the reduction of ISNPN income from traditional land-use practice as a result of land seizure or withdrawal in favor of the industry-related needs. YNAD heads the list in the country as far as the said indicator is concerned (103.7 thousand ha of disturbed land). Ecological effects are associated not only with land withdrawal, but also with land contamination and the growth of emissions in the atmosphere and discharge in water, which result in natural-resources potential reduction – the fund of ISNPN preservation and development. The social effect includes forced migration, development and growth of assimilation; the young generation, the significant part of which cannot adapt to new conditions, goes lumpen and alcoholic. Fertility behavior of individuals of childbearing age changes due to the shortage of

fiancées as a results of increased competition caused by the arrival of non-indigenous young men to the areas of traditional residence, birth-rate decrease, and growth of premature mortality by unnatural causes. Population growth due to the newcomers also causes poaching. This applies, in particular, to valuable species of fish. Their reproduction has reduced sharply among other things because of water bodies contamination.

Another feature of mineral deposits location should be noted. As nature would have it, the most significant deposits in the subsoil coincide with the most productive biocenoses on the surface. In this regard, even a trifling seizure of land as compared to large sizes of respective subjects of the Russian Federation cause significant loss for traditional natural resource use, both direct (withdrawal) and indirect (contamination).

In order to provide sustainable development of indigenous small-numbered peoples, in addition to a long list of social actions, regional special-purpose programs are being developed for the medium term. Thus, in the Yamalo-Nenets Autonomous District, in order to shape sustainable development of indigenous small-numbered peoples of the North, an integrated program called "Sustainable development of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District for 2018–2020" has been approved, tasked with:

– social and economic development of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District;

– social development of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District including the sphere of education and science, health care, construction and housing, social service and social security;

– ethnocultural development of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District;

– ecological development and protection of primordial living environment of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District;

– protection of rights and legal interests of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District (*Sustainable development of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District for 2018–2020. YAND Government Order no. 1271-p of December 12th 2018 "On the approval of the integrated program "Sustainable development of indigenous small-numbered peoples of the North in the Yamalo-Nenets Autonomous District for 2018–2020". Available from: https://www.garant.ru/hotlaw/yamalonenecky/1234977 (Accessed August 9th 2019)*).

Similar programs exist in Nenets Autonomous District and Krasnoyarsk Krai. The main drawback of the regional programs includes their emphasis on social and cultural development, while the economic component is presented only by current expenses. Mining enterprises also try to get along with indigenous peoples of the North, developing programs and cooperation agreements with ISNPN. However, in this case, it is not unambiguous enough, as soon as a cornerstone of these documents is compensation in physical and monetary terms which does not always offset the damage caused to the nature of indigenous population.

In the authors' opinion, high-priority activities aimed at sustainable development of ISNPN should include as ascribed below.

The development of co-management practices at the territories of traditional natural resource use with licensed sites, industrial and transport infrastructure. Such practices were developed in ECORA project by UNEP-GEF for the territory of Russia (*CAFF technical report, 2009, no. 19. Available from: http://library.arcticportal.org/1528/1/ECORA_Report_Russian.pdf (Accessed July 18th 2019)*). Special co-management

training programs are required for the representatives of indigenous small-numbered peoples.

Creation of indigenous peoples cultural sites map, including work areas and sacred territories, both within the boundaries of traditional natural resource use area and beyond (deer migration routes and sacred objects, including virtual ones).

When planning non-operating use of the territories of traditional natural resource use, it is required to introduce the creation of the matrix of conflict with the description of environmental services (resource and habitat-forming ones), which are used in traditional nature resource use and will be used directly or indirectly in industrial, transport or other types of nature resource use [13].

In the areas of cultural heritage of indigenous small-numbered peoples and sacred objects, other types of natural resource use other than natural must be prohibited. These territories may be home to ethno-natural parks which may become the objects of travel company activities.

Ecological and economic estimate of the cost of the natural capital of the territories of traditional natural resource use may be considered as an alternative cost of their lots intended for other types of nature resource use. Compensatory payments should be calculated with the account of the indicated estimates. The current level of payment is about 25% [18].

Based on ecological and economic estimates of environmental services of the territories of traditional natural resource use, it is required to review its functions in the structure of the modern regional economy.

The territories of traditional natural resource use may be considered as regions of "environmentally sound" types of natural resource use and may be included into the system of natural frame when used in accordance with traditional ecological knowledge of ISNPN.

The efficiency of using the territories of traditional natural resource use should be improved by means of upgrading them technically and developing new uses (eco- and ethno-tourism).

Preservation of indigenous peoples' traditional life support and household as a desire to optimize their material and psychological wealth by means of natural resources [19, p. 110].

For the time being, indigenous small-numbered peoples, engaged in traditional natural resource use, need help organizing products processing (venison, wild harvest, and fish) and its transportation to sales markets.

Active support from the public authorities and local government of communities or other forms of self-organization of indigenous peoples through fiscal and tax policy [20, p. 41].

Traditional ecological knowledge should be reinterpreted in order to adapt new types of natural resource use to the natural conditions of the region.

Sustainable development of indigenous small-numbered peoples living at the territory of the region requires high-priority attention to the preservation of their language and culture, the death of which inevitably causes the death of the ethnos, depletes cultural diversity of peoples in Russia which is a pledge of its sustainable development.

Due to the exploitation of remote arctic territories, the role of scientific research concerning ISNPN and environment increases with the purpose of estimating their current state and effects from commercial activities. The introduction of basic research in various branches of science (economy, sociology, ecology, ethology, geography, biology, medicine, etc.) is not enough, applied research is also required. Scientific report "Developing the system of monitoring the state of relationship between economic

agents and indigenous population" may serve as an example of such investigations (*The project has been prepared within the project funded by the National Public Establishment of the Yamalo-Nents Autonomous District "Arctic Research Center" (state contract no. 10ок-1457/2012 of June 14th 2012). Research and development center "Perspektiva". 135 p. Available from: www.ntcpa.ru*) and Ethnic monitoring in the Yamalo-Nenets Autonomous District [21].

Summary. Commercial exploitation of the Arctic provokes conflicts associated with ISNPN. In order to prevent adverse effects for ISNPN, it is required to forecast the possible conflicts and take appropriate measures to prevent conflicts, including the introduction of the measures proposed by the authors aimed at ISNPN sustainable development.

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Согласование интересов при освоении нефтегазовых ресурсов северных территорий Российской Федерации

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Реферат

Актуальность. *Отработка промышленных запасов топливно-энергетических и минеральных ресурсов в освоенных районах страны предусматривает увеличение добычи полезных ископаемых, в том числе нефтегазовых ресурсов, расположенных в Арктике. В свою очередь освоение ресурсов недр будет иметь отрицательные последствия экономического, экологического и социального характера. К числу последних относятся последствия, связанные с ухудшением условий жизни коренного малочисленного населения Севера (КМНС), что требует изыскания возможностей взаимного бесконфликтного сосуществования недропользователей и КМНС.*

Цель работы. *Выяснение основных отрицательных последствий для КМНС, связанных с промышленным освоением арктических территорий, и обоснование системы мер, реализация которых способствует устойчивому развитию традиционного природопользования и КМНС.*

Методы исследования. *В процессе работы использовались методы систематизации, факторного, сравнительного и системного анализа.*

Результаты исследования. *Из характеристики нефтегазовых и горнодобывающих административных образований Арктической зоны Российской Федерации (АЗРФ) следует, что объем добычи полезных ископаемых (нефть и конденсат, природный газ) в последние годы нарастает. Так, добыча природного газа в Ямало-Ненецком автономном округе в 2018 г. выросла на 7,4 % по сравнению с 2017 г., добыча нефти по итогам 2018 г. выросла на 2 %. Ожидаемо формирование новых центров добычи нефти, газа и угля, которые на сегодня находятся на стадии геологоразведочных работ. Естественен и рост интенсивности и нарастающего воздействия на окружающую среду (природную среду, население, в том числе КМНС). Обобщение и анализ опыта разработки нефтяных и газовых месторождений показывает, что наиболее серьезные конфликтные ситуации возникают между промышленным освоением территории и традиционным природопользованием: загрязнение площади оленьих пастбищ, изъятие земель под промышленное и транспортное строительство и др. Реализация комплексных программ, ориентированных на устойчивое развитие КМНС, в которых основной упор делается на социально-культурное развитие без соответствующего экономического обеспечения, не решает рассматриваемую проблему. Авторами предлагается система мер, направленная на сохранение «кормящего ландшафта» аборигенов и их культурного наследия и учитывающая специфику современного состояния традиционного хозяйствования и коренного населения, занятого в нем. Основное внимание сосредоточено на эффективности использования территорий традиционного природопользования, сохранение их в границах культурных ландшафтов, оказание поддержки со стороны государства, введение в практику эколого-экономической оценки природного капитала территорий традиционного природопользования (ТТП) и компенсации выплат при нанесении вреда биоте, рассмотрение ТТП в качестве составляющих экологического каркаса, сохранение культурного наследия этноса. Во многом решению проблемы взаимного сосуществования могут помочь научные исследования соответствующей направленности.*

Выводы. *Для предотвращения отрицательных последствий для КМНС при промышленном освоении Арктики необходимо прогнозировать возможные конфликтные ситуации и предупреждать их, чему будет способствовать реализация предлагаемой авторами системы мер, направленных на устойчивое развитие КМНС.*

Ключевые слова: *Арктическая зона Российской Федерации; промышленное освоение; нефтегазовые и минеральные ресурсы; традиционные отрасли; коренные малочисленные народы Севера.*

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