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LAW AND POLICY FOR SUSTAINABLE DEVELOPMENT OF THE RUSSIAN ARCTIC

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The Arctic region is one of the most fragile and environmentally important regions on the planet. Today, it is facing increasingly larger threats including climate change, habitat loss and land fragmentation from infrastructure and industrial development, chemical pollution, the disappearance of traditional activities and knowledge of the northern indigenous peoples. To contribute to sustainable development of the Arctic the young people and specialists working in the North should know about the peculiarities of the Arctic lands and species as well as about the ways to achieve sustainability in the Arctic.

The scope of the textbook is description of the Arctic regions, mostly in the Russian Federation, and the frameworks of legal regulations of the Arctic land use in the period of industrial development and increasing environmental impacts. The objective is to give an overview of the existing policies and laws and outline the most effective legal mechanisms which provide for sustainable development of the Arctic. A part of the book is devoted to a scenarios planning exercise – presenting the ideas of how the Arctic and, especially, the Yamal region can be developing in the near future.

For students studying in the field of "State and municipal management", as well as other areas of training. It is of interest to a wide readership.

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МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РОССИЙСКОЙ ФЕДЕРАЦИИ
ТЮМЕНСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ
УНИВЕРСИТЕТ ПРИКЛАДНЫХ НАУК ОСНАБРЮК
ВЕСТФАЛЬСКИЙ УНИВЕРСИТЕТ ИМЕНИ ВИЛЬГЕЛЬМА II
(УНИВЕРСИТЕТ МЮНСТЕРА)

Е. Ф. Гладун
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Й. Камп

ПРАВОВОЕ РЕГУЛИРОВАНИЕ УСТОЙЧИВОГО РАЗВИТИЯ РОССИЙСКОЙ АРКТИКИ

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В монографии исследуются вопросы развития арктических территорий на примере Российской Федерации, в частности Ямало-Ненецкого автономного округа. Авторы рассматривают наиболее значимые аспекты использования и охраны арктических земель.

Арктический регион является одним из самых хрупких и экологически важных регионов планеты. В настоящее время в Арктике увеличивается количество проблем, связанных с изменением климата, потерей биоразнообразия, фрагментацией земель в результате промышленного освоения и химического загрязнения. Исчезают традиционные виды деятельности и система знаний коренных народов Севера. Представленный в монографии материал окажет существенное влияние на формирование компетенций специалистов, работающих на арктических территориях, необходимых для устойчивого развития Арктики.

Адресуется студентам, обучающимся по направлению «Государственное и муниципальное управление», а также иным направлениям подготовки. Представляет интерес для широкой читательской аудитории.

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CONTENT

SUMMARY

The Arctic region is one of the most fragile and environmentally important regions on the planet. Today, it is facing increasingly larger threats including climate change, habitat loss and land fragmentation from infrastructure and industrial development, chemical pollution, the disappearance of traditional activities and knowledge of the northern indigenous peoples. To contribute to sustainable development of the Arctic the young people and specialists working in the North should know about the peculiarities of the Arctic lands and species as well as about the ways to achieve sustainability in the Arctic.

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CHAPTER 1
SUSTAINABLE DEVELOPMENT

Sustainable development has emerged as an integral concept, linking together important global issues including economic growth, social stability and environmental stewardship. Understanding sustainable development demands a close analysis of evolving definitions, conceptual applications, and mechanisms of international and domestic implementation. The impact of binding (hard) and non-binding (soft) law must additionally be explored to understand the application of sustainable development to the Arctic.

Sustainable development is a new way of approaching the environment and its relationship to everything else we care about as a society. Sustainable development has become a central assumption of modern environmentalism and it is the main approach in international relationship towards the environment. This is the reason why we need to understand the scope of sustainable development before studying law and policy of any country located in the northern territories.

§ 1. THE IDEA OF SUSTAINABILITY

A common definition of "sustainability" captures the idea of coordinating human behavior in the natural environment and regulating the consumption with the capacity of ecological systems to supply, over a long period of time, such natural resources as air, soil, or water on which mankind depends. To achieve sustainable development and a higher quality of life for all people, states should reduce and eliminate unsustainable patterns of production and consumption.[1] This notion of sustainability lies at the core of many "commons" problems, where the central issue is to enable "individuals to sustain long-term, productive use of natural resource systems".[2]

[1] United Nations Conference on Environment and Development, Declaration of Principles, Principle 8. 1992. In: Robert, V. Percival et al. 1996. *Environmental Regulation, Law, Science, and Policy* 1268.

[2] Ostrom, E. 1990. *Governing the Commons.* Cambridge University Press, p. 1.

Because “sustainable” modifies “development” in the term “sustainable development”, it is first important to understand what development means. Since the end of World War II, development has included at least four related concepts: peace and security, economic development, social development, and national governance that secures peace and development. Each concept is reflected in major multilateral treaties that provide a common framework for relations among sovereign nations as well as a shared set of national purposes. This development model has, in many ways, been remarkably successful. The world’s economy “has grown with unprecedented speed” since World War II, and most people have experienced a rise in their standard of living. We have not experienced a Third World war or another global depression. Yet the traditional development model has failed in two basic respects – it has not prevented the growing number of people living in poverty, and it has not curtailed continuing and perhaps accelerating deterioration of the global environment.[1]

Thus, sustainable development changed the prior approach to development, which called for peace and security, economic development, human rights, and supportive national governance, by adding a fifth element – protection of the environment.

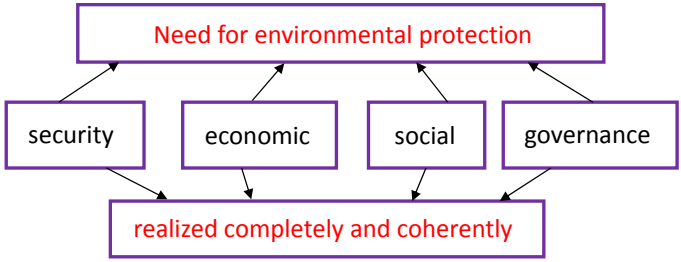

Figure 1. Need for environmental protection

Sustainable development required the adoption of environmental policies which ensure that resources are replenished at rates that match or exceed levels of consumption. The term “sustainability” was first introduced on the global stage in the 1970s. In 1972, the United Nations convened the Stockholm Conference on the Human Environment to address evolving environmental problems.[2]

The concept of sustainable development implied that present generation must leave a world with reasonably clean air, water, and land, and a fair share of nonrenewable

[1] Dernbach, J. C. 2002. ‘Sustainable Development: Now More than Ever’. *Environmental Law Reporter* 32 (1): 45.

[2] Canuel, E. 2016. ‘Sustainable Development, Natural Resource Extraction, and the Arctic: The Road Ahead’. *Alaska Law Review* 33 (1): 34.

resources.[1] Many environmental problems are global in scope, such as the depletion of the ozone layer or misuse and, as the result, degradation of land, so they must be approached cooperatively by all nations and on the base of sustainable development.

The concept began to gain significant international attention when it was endorsed in 1987 by the World Commission on Environment and Development (or Brundtland Commission).[2] The word sustainability is derived from the Latin sustinere (tenere) which means to "hold".[3] Dictionaries provide more than ten meanings for "sustain", the main ones being to "maintain", "support", or "endure". However, since the 1980s sustainability has been used more in the sense of human sustainability on planet Earth. Since March 20, 1987 after the work of Brundtland Comission of the United Nations this has resulted in the most widely quoted definition of sustainability and sustainable development: "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[4] This one-sentence explanation has been widely quoted since then.

The triple bottom line – "economics – society – environment" – is the basic understanding of sustainable development which is universally accepted and has various interpretations.[5] This can be illustrated as three concentric circles.[6]

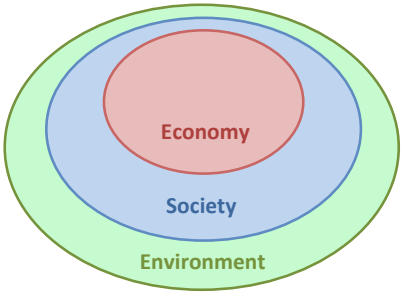

Figure 2. Pillars of sustainable development

[1] Campbell-Mohn, C., Breen, B., Futrell, J. W., McElfish, J. M. Jr., Grant, P. (eds.). 1993. *Sustainable Environmental Law: Integrating Natural Resource and Pollution Abatement Law From Resources To Recover*. Environmental Law Institute, pp. 158-159.

[2] World Commission on Environment and Development. 1987. *From One Earth to One World: An Overview.* Oxford University Press.

[3] What is sustainability? Soil and More International. http://soilandmore.com/index.php/Sustainability-Solutions/Sustainability-Insight/What-is-sustainability (accessed 20 March 2017).

[4] Report of the World Commission on Environment and Development: Our Common Future. United Nations Organization official website. http://www.un-documents.net/our-common-future.pdf (accessed 20 March 2017).

[5] Holling, C. S. 2000. 'Theories for Sustainable Futures'. *Conservation Ecology* 4 (2): 7.

[6] Sustainability. Environment and Ecology. http://environment-ecology.com/what-is-sustainability/247-sustainability.html#cite_note-Daly_.26_Cobb_1989-16 (accessed 20 March 2017).

Ultimately, sustainable development forces us to see the environment as a source of wealth and well-being, or natural capital, that must be protected for present and future generations. Sustainable development broadly requires that the well-being of the present generation should not be increased at the expense of welfare of future generations, and society's well-being should not decline over time. The next generation can only produce as much well-being as the present one if it has the same stock of capital available to it. To put it in simple terms, sustainability implies 'living off the interest', rather than 'living off the capital'. The capital stock can be thought of as comprising three kinds of capital:

— natural capital such as forests, air, water, soils and biodiversity (normally referred to as environmental resources) and other resources like minerals;
— human capital such as human resources, skills, and knowledge;
— human-made capital such as manufactured capital and goods, machinery, infrastructure, buildings, etc.[1]

Table 1

Types of capital

Natural capital	Human capital	Human-made capital
Renewable and non-renewable resources	Education	Factories
Biodiversity	Technology	Farms
Sink capacity of the nature	Government	Equipment
Ecological systems and ecosystem services	Social and economic systems	Industrial infrastructure

At a minimum, a country should maintain a constant stock of aggregate capital over time. One of the key purposes of sustainable development is to consider choices about the composition of the constant capital stock to be maintained will determine whether it is on a path towards:

— **weak sustainability**, where a country/society substitutes natural capital with human, or human-made capital (e.g., it depletes half of its primary forests to build factories, tourist resorts and schools); or
— **strong sustainability**, where it does not substitute natural capital with other forms (e.g., it conserves a permanent estate of primary forest).[2]

[1] A Pocket Guide to Sustainable Development Governance. 2011. Stoddart, H. (ed.). London: Stakeholder Forum and Commonwealth Secretariat.

[2] Ibid.

For renewable resources (e.g., fish, forests, water) and sinks for wastes (e.g., the atmosphere) to be used at sustainable levels, the rate of harvesting them (or discharge of emissions) must not exceed their rate of regeneration (or assimilative capacity). Non-renewable natural resources such as minerals do not regenerate and in their case, sustainability becomes a question of maintaining utility over time, either by expanding reserves (through recycling, efficiency gains, exploration), or by investing income surpluses in alternative resources that will be available for future generations.[1]

The conceptualisation of sustainable development that has emerged is one of development that integrates three pillars: economic development, social development, and environmental protection. Progress across all three pillars in a consolidated manner is seen as critical in the achievement of truly sustainable development. A significant obstacle to achieving sustainable development globally is the lack of a coherent approach that fully integrates all three pillars of sustainable development in pursuit of an over-arching goal. On the contrary, a number of different processes have emerged that seemingly address each pillar in isolation, and even sustainable development itself has arguably become yet another pillar, with its own associated architecture and processes which do not necessarily represent a 'coming-together' of all three pillars.[2]

§ 2. DEFINITIONS OF SUSTAINABLE DEVELOPMENT

There is no universally accepted definition of sustainability. The simple definition "sustainability is improving the quality of human life while living within the carrying capacity of supporting eco-systems", though vague, conveys the idea of sustainability having quantifiable limits.[3] But sustainability is also a call to action, a political process, so some definitions set out common goals and values. The Earth Charter speaks of "*a sustainable global society founded on respect for nature, universal human rights, economic justice, and a culture of peace*".[4]

To add complication the word sustainability is applied not only to human sustainability on Earth, but to many situations and contexts over many scales of space and time, from local ones to the global balance of production and consumption. It can also refer to a future intention: "sustainable agriculture" is not necessarily a current situation but a goal for the future, a prediction.[5]

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[1] A Pocket Guide to Sustainable Development Governance. 2011. Stoddart, H. (ed.). London: Stakeholder Forum and Commonwealth Secretariat.

[2] Ibid.

[3] What Exactly Is Sustainability? Dandalk. Institute of Technology. https://www.dkit.ie/sustainability-group/what-exactly-sustainability (accessed 26 March 2017).

[4] The Earth Chareter. 2000. Earth Charter Initiative. http://earthcharter.org/discover/the-earth-charter (accessed 20 March 2017).

[5] Costanza, R. and Patten, B. C. 1995. 'Defining and predicting sustainability'. *Ecological Economics* 15 (3): 193-196.

Definitions of Sustainable Development

1. Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland Commission).
2. Socially responsible economic development that protects the resource base and the environment for the benefit of future generations (Agenda 21).
3. Three E-Formula: environment, economy, and equity (John C. Dernbach).
4. The process of progressive change in the quality of life of human beings, which places it as the center and primordial subject of development, by means of economic growth with social equity and the transformation of methods of production and consumption patterns, and which is sustained in the ecological balance and vital support of the region (Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific).

Box 1. Definitions of sustainable development

§ 3. THE EVOLUTION OF THE "SUSTAINABILITY" APPROACH

The Brundtland Commission made a very important conclusion: the four basic components of development – peace and security, economic development, social development, and proper governance – require environmental protection. Subsequent events have confirmed this conclusion. Peace and security are related to the condition of the environment in many ways. Environmental stresses and competition for scarce resources can lead to military conflicts. Weapons of mass destruction, particularly nuclear weapons, can have catastrophic impacts on the environment. Money spent on arms is money that is not used to meet basic human needs such as the provision of drinking water and sanitation.[1]

In addition, national economic development objectives frequently lead to the destruction or degradation of natural systems, thus limiting the scope and duration of that development. In most economic activities, this pattern is similar. Unsustainable agricultural practices, for example, contribute to desertification and cause soil erosion, loss of soil fertility, and groundwater pollution. Such practices limit the availability of land for agriculture even though a growing population will require more food. Similarly, the destruction of tropical forests and other habitats for agriculture, logging, and other economic activities could lead to the loss of one-third or more of all existing plant and animal species. Yet genetic material from such species can help make agricultural plants more disease-resistant, and has substantial but largely untapped potential to provide medicines and other products. The use of fossil fuels such as coal and oil for energy results in greenhouse gas emissions into the atmosphere; the resulting climate

[1] Dernbach, J. C. 2002. 'Sustainable Development: Now More than Ever'. *Environmental Law Reporter* 32 (1): 45.

change is currently leading to sea levels rise and inundation in coastal areas; and also threatening to affect agriculture, forests, and ecosystems in significant but yet unknown ways.[1]

Social development suffers when people can no longer earn a living by farming, fishing, or similar activities because of environmental degradation. Poor people tend to be exposed to the worst pollution, and are more likely not to have safe and adequate drinking water. Population growth intensifies pressure on resources such as grasslands and forests, making it difficult for them to grow back before they are used again for grazing or wood cutting. More broadly, environmentally damaging activities tend to hurt humans as well. For example, air pollution from energy use in both developed and developing countries adversely affects both human health and the environment.[2]

Since the end of the 1980s, the principle of sustainable development dominates international activities in the field of environmental protection. The Brundtland Commission Report identified the critical objectives of sustainable development:

— reviving growth but changing its quality;
— meeting essential needs for jobs, food, energy, water, and sanitation;
— ensuring a sustainable level of population;
— conserving and enhancing the resource base;
— reorienting technology and managing risk; and
— merging environment and economics in decision making.[3]

§ 4. SUSTAINABLE DEVELOPMENT IN INTERNATIONAL REGULATIONS

Sustainable development has increasingly found its way into the context of institutions and legal doctrine. The Brundtland Commission's work led to the United Nations Conference on Environment and Development (UNCED), or Earth Summit, in Rio de Janeiro in June 1992.[4] More than 172 governments, 108 at level of heads of state or government and more than 17 000 members of non-governmental organizations (NGOs) participated in this meeting. Although the UNCED is widely recognized for its emphasis on the environment, the nations of the world also endorsed sustainable

[1] Environmental Laws and Their Enforcement. Sustainable Development and National Governance: The Challenges Ahead. 2009. In: Dernbach, J. C. and Tarlock, A. D. (eds.) *Encyclopedia of Life Support Systems.* EOLSS Publishers/UNESCO.

[2] Ibid.

[3] Kiss, A. and Shelton, D. 2007. *Guide to International Environmental Law*. Koninklijke Brill NV, Leiden, The Netherlands.

[4] Earth Summit. United Nations Organization official website. http://www.un.org/geninfo/bp/enviro.html (accessed 20 March 2017).

development for the first time. They did so in two nonbinding texts. The first is the **Rio Declaration on Environment and Development**, a statement of 27 principles for sustainable development.[1] The second is **Agenda 21**, a global plan of action for sustainable development.[2] By agreeing to these texts, countries agreed to foster sustainable development within their own boundaries as well as internationally.[3] Two treaties that are directed at sustainable development were also opened for signature at the UNCED – the **UN Framework Convention on Climate Change** and the **Convention on Biological Diversity**.

Principle 4 of the Rio Declaration states that "in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it".[4]

During the same year (1992), the first attempt to define sustainable development in a binding text appeared in Article 3 (1) (a) of the Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific. For the purpose of this Convention sustainable development means ***the process of progressive change in the quality of life of human beings***[5], which places it as the center and primordial subject of development. It is achieved by means of economic growth with social equity and the transformation of methods of production and consumption patterns, and which is sustained in the ecological balance and vital support of the region. This process implies respect for regional, national and local ethnic and cultural diversity, and full participation of people in peaceful coexistence and in harmony with nature, without prejudice to and ensuring the quality of life of future generations.

However, the global community continues to look for solutions to achieve sustainable development. The United Nations organization, for example, in 2000 started a global effort to tackle global issues, therefore it established measurable, universally agreed objectives for tackling extreme poverty and hunger, preventing deadly diseases, and expanding primary education to all children, among other development priorities.

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[1] Rio Declaration on Environment and Development. 1992. United Nations Organization official website. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm (accessed 10 March 2017).

[2] Agenda 21. United Nations. Sustainable Development. https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf (accessed 10 March 2017).

[3] Dernbach, J. C. 2002. 'Sustainable Development: Now More than Ever'. *Environmental Law Reporter* 32 (1): 45.

[4] Rio Declaration on Environment and Development. 1992. United Nations Organization official website. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm (accessed 10 March 2017).

[5] Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific. 1992. https://wedocs.unep.org/rest/bitstreams/46335/retrieve (accessed 10 March 2017).

§ 5. GOALS OF SUSTAINABLE DEVELOPMENT IN THE NEW MILLENNIUM

Sustainable Development Goals were first developed at the United Nations Conference on Sustainable Development in Rio de Janeiro in 2012.[1] The objective was to produce a set of universal goals that meet the urgent environmental, political and economic challenges facing our world. The final document – Sustainable Development Agenda – was adopted as a set of goals on September 25th 2015 by all countries to end poverty, protect the planet, and ensure prosperity.[2] Each goal has specific targets to be achieved over the next 15 years. The Sustainable Development Goals are unique in that they cover issues that affect all countries and societies. The basic objective is to build a more sustainable, safer, more prosperous planet for all humanity.

Figure 3. Sustainable Development Goals.
Figure published at the official website of the United Nations Development Programme[3]

Sustainable Development Goal 15 concerns the sustainable use of lands. Broadly speaking its focus is to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

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[1] UNDP. 2012. Background on the Goals. http://www.undp.org/content/undp/en/home/sustainable-development-goals/background.html (accessed 10 March 2017).

[2] The Sustainable Development Agenda. Sustainable Development Goals. http://www.un.org/sustainabledevelopment/development-agenda (accessed 10 March 2017).

[3] Sustainable Development Knowledge Platform. United Nations Organization official website. https://sustainabledevelopment.un.org/?menu=1300 (accessed 10 March 2017).

Progress of goal 15

• Preserving diverse forms of life on land requires targeted efforts to protect, restore and promote the conservation and sustainable use of terrestrial and other ecosystems. Goal 15 focuses specifically on managing forests sustainably, restoring degraded lands and successfully combating desertification, reducing degraded natural habitats and ending biodiversity loss.

• Between 1990 and 2015, the world's forest area diminished from 31,7 per cent of the world's total land mass to 30,7 per cent. The loss was mainly attributable to the conversion of forest to other land uses, such as agriculture and infrastructure development. Meanwhile, other areas were transformed into forests through planting, landscape restoration or the natural expansion of forest. Owing to the balance of the two processes and efforts to slow deforestation, the global net loss of forest area declined from 7,3 million hectares per year in the 1990s to 3,3 million hectares per year during the period from 2010 to 2015.

• To safeguard places that contribute significantly to global biodiversity, protected areas have been established and identified as key biodiversity areas. In 2014, 15,2 per cent of the world's terrestrial and freshwater environments were covered by protected areas. The percentage of terrestrial key biodiversity areas covered by protected areas has increased, from 16,5 per cent in 2000 to 19,3 per cent in 2016. Over the same period, the share of freshwater key biodiversity areas that are protected has increased from 13,8 per cent to 16,6 per cent, and the share of mountain key biodiversity areas under protection has grown from 18,1 per cent to 20,1 per cent.

• The focus in Goal 15 on halting biodiversity loss comes at a critical time, since many species of amphibians, birds and mammals are sliding towards extinction. According to the International Union for Conservation of Nature's Red List Index, amphibians are declining most rapidly in Latin America and the Caribbean, primarily as a result of the chytrid fungal disease, one of numerous wildlife diseases on the rise worldwide. The greatest extinction risks for birds and mammals are found in South-Eastern Asia, mainly owing to the conversion of lowland forests. However, their decline is not inevitable, with extinction risks for vertebrate species having been reversed in five small island developing States (the Cook Islands, Fiji, Mauritius, Seychelles and Tonga) as a result of conservation actions over the past several decades.

• Conservation efforts can also be thwarted by poaching and the trafficking of wildlife. Since 1999, at least 7 000 species of animals and plants have been detected in illegal trade, and the list of species under international protection continues to grow. Comparing the size of legal trade in wildlife products (about 900 000 transactions per year) to the quantity of wildlife seized (about 16 000 seizures per year) provides an indication of the scope of illicit wildlife trafficking. The value of legal and illicit wildlife products can also be compared. For example, the value of recorded seizures of Crocodylus genus represents between 0,4 per cent and 0,6 per cent of the value of legal protected exports of this species between 2009 and 2013, with no clear trend discernible.

• In 2014, bilateral Official Development Assistance (ODA) to support biodiversity amounted to $7 billion, an increase of 16 per cent in real terms over 2013. The two largest recipients of biodiversity assistance were the Philippines and India, which together received about $1 billion of the total aid. 1.

Box 2. Goal 15 – Life on Land

§ 6. SUSTAINABLE LAND MANAGEMENT

Sustainable land management is a knowledge-based procedure that aims at integrating the management of land, water, biodiversity, and other environmental resources to meet human needs while sustaining ecosystem services and livelihoods.[1]

Photo 1. Distorted landscapes of the Arctic.
Taken by Sofia Antal, University of Tyumen

Sustainable land management (SLM) is necessary to meet the requirements of a growing population. Improper land management can lead to land degradation and a significant reduction in the productive and service functions. Effective sustainable land management involves:

— **Preserving and enhancing the productive capabilities of land in cropped and grazed areas –** that is, upland areas, downslope areas, and flat and bottom lands;

[1] FMER. 2016. Sustainable Land Management – Glossary. German Federal Ministry of Education and Research. http://modul-a.nachhaltiges-landmanagement.de/en/glossary/glossary/letter/S (accessed 10 March 2017).

sustaining productive forest areas and potentially commercial and noncommercial forest reserves; and maintaining the integrity of watersheds for water supply and hydropower generation needs and water conservation zones and the capability of aquifers to serve the needs of farm and other productive activities.

— **Actions to stop and reverse degradation** – or at least to mitigate the adverse effects of earlier misuse – which is increasingly important in uplands and watersheds, especially those where pressure from the resident populations are severe and where the destructive consequences of upland degradation are being felt in far more densely populated areas "downstream".[1]

Sustainable land management represents the critical merger of agriculture, environment and human socioeconomic well-being. It has the dual objectives to maintain long-term productivity of ecosystem functions for land, water and biodiversity and, at the same time, to increase productivity of goods and services, and particularly safe and healthy food. Well-structured and resourced SLM programs have the potential to provide global environmental benefits through their contribution to combating land degradation and to arresting and reversing decline in biodiversity and other ecosystem services. Effective implementation of SLM programs will also deliver social and economic benefits which is essential to addressing the major challenges facing the world today – food security and climate change.[2]

[1] World Bank. 2006. *Sustainable Land Management: Challenges, Opportunities, and Trade-offs. Agriculture and Rural Development.* Washington, DC: World Bank.

[2] Sustainable Land Management and its Relationship to Global Environmental Benefits and Food Security. A Synthesis Report for the GEF. https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.STAP_.C.50.Inf_.03_SLM_GEBs_and_Food_Security_0.pdf (accessed 10 March 2017).

CHAPTER 2
THE ARCTIC REGION: INDUSTRIAL DEVELOPMENT AND ENVIRONMENTAL IMPACTS

The Arctic region is varied in many aspects and many parts are characterized as being relatively clean and remote. The high Arctic has an extreme environment and many areas lack infrastructure. An exception to this can be found in the more populated and developed parts of northern Scandinavia and northwest Russia. The overall level of economic activity is still relatively low although it has been increasing in recent decades in certain areas. The region's economy and resources now play a role in a global perspective.[1] This role could increase if the region's potential in natural resources, shipping and tourism are exploited further.

In the process of industrial development of the Arctic territory and the raise of hydrocarbon production new sources of contamination will eventually appear and there will be a real threat to the fragile Arctic environment.[2] The Arctic is worth protecting for several reasons. First, it is home to a diversity of fauna and flora specially adapted to their environment – many seen nowhere else on earth, i.e. endemic to the Arctic. Second, it is also home to a number of Arctic peoples with a great deal of cultural and linguistic diversity. Third, the Arctic environment itself is worth protecting because of its uniqueness – it has an 'intrinsic' value.[3]

[1] Glomsrød, S. and Aslaksen, I. 2009. *The Economy of the North 2008.* Oslo – Kongsvinger: Statistics Norway.

[2] Ibid.

[3] Gladun, E. 2015. 'Environmental Protection of the Arctic Region: Effective Mechanisms of Legal Regulation'. *Russian Law Journal* 3: 92-110.

§ 1. DEFINITION OF THE ARCTIC

The Arctic is known as the northernmost region of the Earth. Most often the Arctic is described as ***the area within the Arctic Circle, a line of latitude about 66.5 north of the Equator***. Within this circle are the Arctic Ocean basin and the northern parts of eight countries.[1]

The word "**arctic**" is derived from the Greek word *arktikos*, which means "*near the bear*", in reference to the constellation known as Ursa Major, or the Big Dipper. The two stars on the end of the Big Dipper point to Polaris, or the North Star.[2]

Photo 2. Panoramic view of Polar Ural. Taken from the Archives of PUGGP

In scientific papers the region is described in three ways:

1. One definition of the Arctic is ***any land north of the Arctic Circle, which is the latitude of 66° 33' 44" (or 66.5622°)***.

2. Arctic researchers also define it as ***any land north of the growth of upright trees***.

3. Another research definition of the Arctic is ***areas of high latitude where the average daily temperature on southern exposures doesn't rise above 10°C (50°F)***.[3]

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[1] Arctic. National Geographic. http://www.nationalgeographic.org/encyclopedia/arctic (accessed 10 March 2017).

[2] Arctic World. http://www.arcticworld.net (accessed 10 March 2017).

[3] *To see a map of these three definitions of the Arctic, visit*: National Snow and Ice Data Center (NSIDC). http://nsidc.org/cryosphere/arctic-meteorology/arctic.html (accessed 10 March 2017).

The Arctic region spans approximately 30 million square miles, about half of which consists of ocean. Ice covers approximately 90 percent of the ocean surface while the remaining 10 percent constitutes land masses. These land masses fall within the sovereign jurisdiction of the eight Arctic states: Canada, Denmark (via Greenland), Finland, Iceland, Norway, Russia, Sweden and the United States of America. Although the Arctic Ocean is comparatively shallow, it contains over 25 percent of the world's oceanic continental shelf.[1]

Photo 3. Arctic Ocean without ice. Taken by Denis Zinoviev, University of Tyumen

The Arctic region retains climatic and geographical phenomena: extreme cold, snow and ice, permafrost, sunless days and mid-nights Sun, and polar lights. Some frozen features, such as glaciers and icebergs, are frozen freshwater. In fact, the glaciers and icebergs in the Arctic make up about 20 % of Earth's supply of freshwater. Most of the Arctic, however, is the liquid saltwater of the Arctic ocean basin. Some parts of the ocean's surface remain frozen all or most of the year. This frozen seawater is called sea ice. Often, sea ice is covered with a thick blanket of snow.[2]

[1] Dresser, S. J. 2010. 'Safeguarding the Arctic from Accidental Oil Pollution: the Need for a Binding, Region-specific Shipping Regime'. *Southwestern Journal of International Law* 16: 512.

[2] Arctic. National Geographic. http://www.nationalgeographic.org/encyclopedia/arctic (accessed 10 March 2017).

§ 2. CHARACTERISTICS OF THE ARCTIC REGION

The Arctic region can be given some other important characteristics:

1) sensitive and poorly understood environments;
2) unique ecosystems;
3) abundant natural resources;
4) uncertain legal regime.

The academics Gail Osherenko and Oran R. Young have identified several factors that make the Arctic one of the most environmentally fragile regions on earth[1]:

— low temperatures retard the decomposition of natural and manmade substances and the breakdown of pollutants[2];
— regeneration is a protracted process because of the short growing season;
— large concentrations of animals heighten vulnerability to catastrophes;
— marine areas are particularly important in the Arctic in comparison with other regimes of the globe;
— climatic conditions are likely to produce a more pronounced carbon dioxide-induced warming trend in the Arctic region than in temperate regions and are already leading to high concentrations of air pollutants that threaten vegetation as well as human and animal health;
— severe weather and ice dynamics make environmental protection and cleanup extremely difficult.[3]

The region is home to a number of sensitive marine and terrestrial ecosystems[4], some of global importance, as the Arctic is a breeding ground for a number of migrating species. More than half of the world's wetlands are in the Arctic and sub-Arctic region.[5]

The Arctic ecosystem services include carbon sequestration, climate regulation, biodiversity and cultural maintenance, fuel, and food and fibre production. The Arctic significantly contributes to global biodiversity.[6] For example, the Arctic tundra, which is

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[1] Dresser, S. J. 2010. 'Safeguarding the Arctic from Accidental Oil Pollution: the Need for a Binding, Region-specific Shipping Regime'. *Southwestern Journal of International Law* 16: 514-515.

[2] The commentator points out that centuries may pass before metal objects corrode and vanish; spilled oil may take years to degrade. While organic pollutants found in the water sources of temperate zones normally break down after only a few hundred kilometers, the non-organic pollutants in the Arctic may travel vast distances before completely dissipating (*See*: Pew Environmental Group. 2010. Oil Spill Prevention and Response in the U.S. Arctic Ocean: unexamined risks, unacceptable consequences. http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/PEW-1010_ARCTIC_Report.pdf (accessed 17 March 2017).

[3] Osherenko, G. and Young, O. R. 2005. *The Age of the Arctic: Hot Conflicts and Cold Realities*. Cambridge University Press, pp. 110-116.

[4] CAFF. 2013. Arctic Biodiversity Assessment. http://www.caff.is/assessment-series/233-arctic-biodiversity-assessment-2013 (accessed 17 March 2017).

[5] Intergovernmental Panel on Climate Change. 2000. A2 and B2 Emission Scenarios. In: IPCC *Special Report Emissions Scenarios*. Published for Intergovernmental Panel on Climate Change.

[6] Tundra and Arctic/Antarctic ecosystems. 2007. IPCC Fourth Assessment Report: Climate Change. https://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch4s4-4-6.html (accessed 17 March 2017).

found in Alaska, Greenland, Canada, Europe and Siberia is one of the most unique places on the planet Earth which is characterized by:

- an extremely cold climate;
- low precipitation;
- surface drainage only;
- small number of wildlife and plant species;
- short growing season and reproduction;
- limited supply of nutrients;
- large variation in population abdundance and dynamics of specialised wildlife.[1]

Photo 4. Salekhard, Yamalo-Nenets Autonomous District.
Taken by Denis Zinoviev, University of Tyumen

Despite the harsh conditions, there is a surprising amount of diversity of species in the Arctic tundra including mammals (lemmings, voles, caribou, arctic hares, squirrels, arctic foxes, ermine, polar bears, arctic shrews, weasels and wolves), birds (loons, snowy owls, ptarmigans, snow geese, etc.), fish (cod, flatfish, salmon, trout), insects (arctic bumblebees, blackflies, grasshoppers, mosquitoes and specialised moths), and even amphibians – wood frogs, which are freeze-tolerant.[2]

[1] Arctic Tundra Ecosystem. 2014. Wild Tracks. https://wildtracks.wordpress.com/world-ecosystems/tundra-ecosystems/arctic-tundra-ecosystem (accessed 17 March 2017).

[2] Ibid.

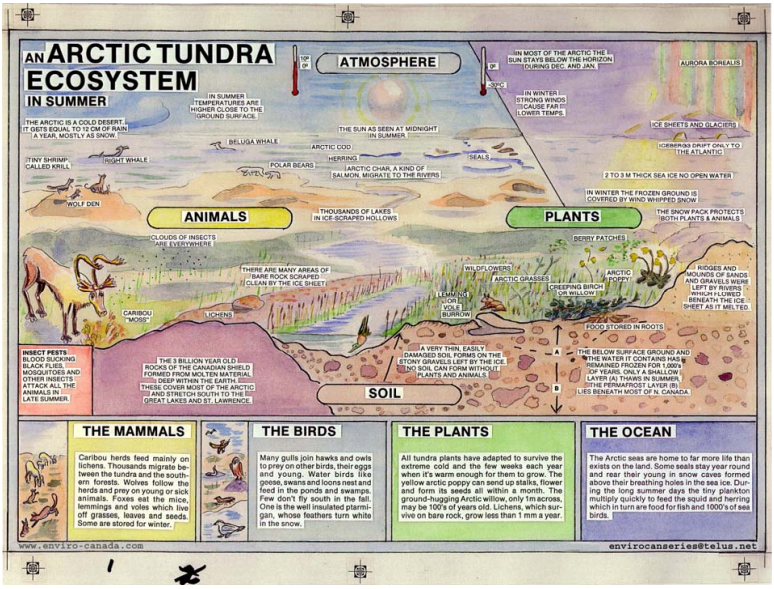

Figure 4. Arctic Tundra Ecosystem. Figure published at the website Animal pictures[1]

The few plants and animals that live in the harsh conditions of the tundra are essentially clinging to life. They are highly vulnerable to environmental stresses like reduced snow cover and warmer temperatures brought on by global warming.[2]

§ 3. ENVIRONMENTAL PROBLEMS

The Arctic matters to the rest of the planet – as the driver of many of the world's climate and ocean systems, as the homeland of indigenous peoples who have inhabited the region for thousands of years, and as the site of some of the world's largest remaining intact ecosystems.[3]

At the same time, it is a place of rapid change. Ecosystems face increasing pressure from the combined effects of climate change, transboundary pollutants and increasing

[1] Animal Pictures. http://animal-picture.com/tundra-ecosystem.html/tundra-ecosystem-2-jpg (accessed 25 May 2017).

[2] Tundra. National Geographics. http://www.nationalgeographic.com/environment/habitats/tundra-biome (accessed 17 March 2017).

[3] GRID-Arendal. 2016. Polar and Mountain Environments. http://www.grida.no/activities/10 (accessed 10 February 2017).

industrial development. Human societies across the Arctic are trying to respond to these changes in many ways.

Arctic warming affects traditional ways of life of indigenous peoples, puts stress on ecosystems and can have global implications. Climate change is therefore a threat in terms of Arctic ecosystem resilience and functions.[1] It is also a challenge with regards to ensuring timely adaptation measures, while mitigation efforts are strengthened at a global scale.

The following environmental issues are mostly reported to affect the Arctic:

1. Increasing temperatures are already showing many effects on Arctic biodiversity including the northward movement of more southern species, shrub encroachment and greening (i.e. productivity increases) of the land, changing plant communities and their associated fauna, increases in migrating invasive species displacing native Arctic flora and fauna, and the emergence of new diseases. The Arctic is home to some globally significant populations of species distributed on land, and in the rivers, lakes, wetlands, and seas of the Arctic – some of which are already declining. Changes in biodiversity are also creating both challenges and opportunities for Arctic peoples.[2]

2. The Arctic is particularly sensitive to global warming and is undergoing some of the most rapid changes on the planet.[3] Amongst the rapid changes observed, air temperatures in the Arctic have been rising at almost twice the global average[4]; Arctic sea ice extent and thickness has declined dramatically and the process of melting is accelerating; and the surface of the Arctic Ocean is warming. On land, permafrost, which contains large stores of carbon, is warming and thawing at the margins of its distribution.[5]

There are also global impacts – changes in the Arctic are currently and will affect the rest of the world in the future. Changes in the Arctic are, amongst others, altering atmospheric and oceanic circulation that affects weather patterns, raising the global sea level through the increased melting of ice sheets and glaciers; and increasing the emission of carbon dioxide and methane through thawing permafrost.[6]

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[1] Arctic Resilience Report. The Arctic Council official website. http://arctic-council.org/arr (accessed 27 March 2017).

[2] GRID-Arendal. 2016. Polar and Mountain Environments. http://www.grida.no/activities/10 (accessed 10 February 2017).

[3] Miller, Z-S. 2016. The Arctic. Prezi. https://prezi.com/y6sklayaispa/the-arctic (accessed 2 February 2017).

[4] Climate change in the Arctic. 2016. Select Committee on the Arctic — Report of Session 2014-15. Parliament UK official website. https://www.publications.parliament.uk/pa/ld201415/ldselect/ldarctic/118/11805.html (accessed 2 February 2017).

[5] Miller, Z-S. 2016. The Arctic. Prezi. https://prezi.com/y6sklayaispa/the-arctic (accessed 2 February 2017).

[6] Climate change in the Arctic. 2016. Select Committee on the Arctic — Report of Session 2014-15. Parliament UK official website. https://www.publications.parliament.uk/pa/ld201415/ldselect/ldarctic/118/11805.html (accessed 2 February 2017).

Photo 5. The Ob river, Yamalo-Nenets Autonomous District. Taken by Denis Zinoviev, University of Tyumen

Photo 6. "Hot spots" in the Russian Arctic, Yamalo-Nenets Autonomous District. Taken by Andrey Yurtaev, University of Tyumen

3. Decreasing sea ice and the thawing of permafrost is altering transport opportunities in the Arctic. At sea, climate change is allowing for longer shipping seasons and new routes. On land, however, there are negative implications for access to remote communities and inland industry. Thawing conditions already severely limit and/or shorten the periods of access through ice roads during winter. These new transport opportunities in the Arctic will have strong implications for the environment. The physical impact on landscapes from extractive industries (e.g., pipelines causing land fragmentation) and the risk of pollution (e.g., through oil spills) make it important to start addressing these challenges by ensuring a more holistic way of harmonizing transport regimes.[1]

4. The Arctic is often seen as a remote and pristine area little affected by pollution. This is not entirely true, as the Arctic is a major recipient for industrial chemicals coming from different polluting sources in the mid-latitudes and carried to the Arctic through the process of transboundary pollution. Arctic ecosystems and species are heavily affected by industrial development accompanied by pollution (especially persistent organic pollutants (POPs)[2] and mercury[3]) and marine litter from long-range transport and local sources.

Biological processes taking place in the Arctic Ocean – a closed basin – favor the accumulation and retention of pollutants that then enter the food chain. As a result, Arctic peoples and ecosystems are exposed to high levels of heavy metals and radiation.

Predicting the impact of contaminants is difficult because of the complex interactions between the physical, chemical, biological and human factors involved. At the same time, climate change is causing changes in the release, distribution and degradation of highly toxic chemicals.[4]

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[1] GRID-Arendal. 2016. Polar and Mountain Environments. http://www.grida.no/activities/10 (accessed 10 February 2017).

[2] AMAP. 2010. *Persistent Organic Pollutants (POPs) in the Arctic*. AMAP Assessment 2009. Total Environment Special Issue. Elsevier.

[3] Ibid. 2011. *Mercury in the Arctic*. AMAP Assessment 2009. Total Environment Special Issue. Elsevier.

[4] GRID-Arendal. 2016. Polar and Mountain Environments. http://www.grida.no/activities/10 (accessed 10 February 2017).

§ 4. NATURAL RESOURCES AND INDUSTRIAL DEVELOPMENT

As well as one of the most fragile and globally important the Arctic is one of the main resource-rich regions on the planet. The Arctic has recently become the subject of new political, legal, social and economic claims. The reason of this "polar race"[1] is that the Arctic contains oil and gas reserves, both onshore and offshore, large coal reserves[2] as well as important fish stocks like cod and herring.[3] Significant reserves are already being exploited on land and close to shore in Alaska, Canada and the Russian Arctic[4] and they are becoming readily available as climate change increases sea ice depravation.

The Arctic region is an area of growing strategic importance in terms of increasing access to natural resources and new transport routes as ice and snow conditions are undergoing rapid change. Economic developments are accelerating which can be beneficial for the region and the global economy, yet they will also have repercussions on the Arctic's fragile environment if not managed with care.[5] In the process of industrial development of the Arctic territory and the raise of hydrocarbon production new sources of contamination will eventually appear and there will be a real threat to fragile Arctic environment.[6]

Major economic activities taking place in the region are:

— 10 % of global marine fisheries, including large catches in the European part[7];
— hydrocarbon development in the Barents and Norwegian seas[8] (about 22 % of the world's natural gas and 10 % of oil are produced in the Arctic[9]). In 2012, Russia and

[1] In his article "The New Polar Race" Scott Appleton said: countries are making competing territorial claims to the polar regions for defense, environmental protection and vast mineral resources. But such claims always prove controversial. *See*: Appleton, S. 2011. 'The New Polar Race'. *IBA Global Insight* 65 (1): 34.

[2] Malloy, B. A. 2010. 'On Thin Ice: How a Binding Treaty Regime Can Save the Arctic'. *Hastings West-Northwest Journal of Environmental Law and Policy* 16: 471.

[3] Verhaag, M. A. 2003. 'It Is Not Too Late: The Need for a Comprehensive International Treaty to Protect the Arctic Environment'. *Georgetown Environmental Law Review* 15: 555-567.

[4] Ripley, P. 2011. 'Unlocking Oil and Gas Reserves in the Arctic Ocean: Is There a Conventional Solution to Delimitation of the Maritime Boundaries?' *Journal of Energy & Natural Resources Law* 29 (2): 247.

[5] Glomsrød, S. and Aslaksen, I. 2009. *The Economy of the North* 2008. Oslo – Kongsvinger: Statistics Norway.

[6] Ibid.

[7] Stępień, A., Koivurova, T., Kankaanpää, P. 2014. *Strategic Assessment of Development of the Arctic.* An Assessment conducted for the European Union (including a Compendium of European Arctic Initiatives).

[8] AMAP. 2007. Arctic Oil & Gas. http://www.amap.no/documents/doc/arctic-oil-and-gas-2007/71 (accessed 20 February 2017).

[9] Lindholt, L. and Glomsrød, S. 2011. *The Role of the Arctic in Future Global Petroleum Supply.* Statistics Norway.

Norway alone provided more than half of the EU's oil and gas imports[1], much of which was produced in the Arctic region;

— Arctic shipping is increasing, most significantly to and from Arctic ports but also in trans-Arctic voyages. The Northern Sea Route along the Russian coast has seen an increase from four trips in 2010 to 71 in 2013.[2] However, sea-based activities in the Arctic are challenging due to waters with varying ice-cover, lack of sea charts, light conditions in winter and remoteness in case of accidents. Remoteness is also a problem when tackling potential pollution incidents.

Photo 7. Oil fields on the Yamal Peninsula. Taken by Radis Sibagatullin

Around 41 percent of the Arctic oil resources and 70 percent of gas resources are in Russia. That makes Russia one of the most important players in the Arctic, with significant economic, security and governance interests in the region. In order to access, exploit and deliver Arctic natural resources to global markets, Russia also aims to develop critical infrastructure in the Northern Sea Route, including ports, search-and-rescue centers, route administration, ice-breaking capability, and oil spill response

[1] Eurostat. 2014. http://ec.europa.eu/eurostat/statistics-explained/index.php/Main_Page (accessed 20 February 2017).

[2] Northern Sea Route Information Office. 2013. http://www.arctic-lio.com/node/209 (accessed 20 February 2017).

capabilities.[1] Recently much effort has been taken to regulate these activities and to prioritize the national interests of the Russian Federation in the Arctic.

§ 5. ARCTIC LANDS

Nine million square kilometres of the Arctic region are snow-free for at least a short period during polar summer and on tundra, or in northernmost areas, polar deserts. The arctic scenery on land is flat to gently hilly endless open tundra, with extensive bogs, ponds streams and rivers scattered over it: this is the landscape of much of northernmost Siberia, mainland northern Canada and northern Alaska. Also there are huge mountain ranges, steep cliffs and glaciers and ice caps in between.[2]

Photo 8. Landscapes of the Polar Ural, Yamal. Taken by Eugenia Savenko

As the soil is frozen in the depth (permafrost – in Siberia occasionally more than 1 000 m deep)[3] and only the surface layer is melting during summer, water cannot

[1] The Global Arctic: The Growing Arctic Interests of Russia, China, the United States and the European Union. 2013. ETH Zurich. Center for Security Studies. http://www.isn.ethz.ch/Digital-Library/Articles/Detail/?lng=en&id=172671 (accessed 20 February 2017).

[2] Arctic Land. Terra Polaris. 2010. http://www.terrapolaris.com/5/arctic/the-arctic-in-general/arktische-landflaechen (accessed 20 February 2017).

[3] Shahgedanova, M. 2002. *The Physical Geography of Northern Eurasia.* Oxford University Press, p. 152.

drain away into the depth. This is the reason for widespread swamps, bogs and ponds, even though precipitation in Arctic regions is typically very low – with extreme polar deserts in northernmost areas.[1]

Arctic tundra ecosystems are vulnerable to hydrocarbon development, in part because small-scale, low-intensity disturbances can affect vegetation, permafrost soils, and wildlife out of proportion to their spatial extent. Scaling up to include human residents, tightly integrated arctic social-ecological systems are believed similarly susceptible to industrial impacts and climate change. In contrast to northern Alaska and Canada, most terrestrial and aquatic components of West Siberian oil and gas fields are seasonally exploited by migratory herders, hunters, fishers, and domesticated reindeer.[2]

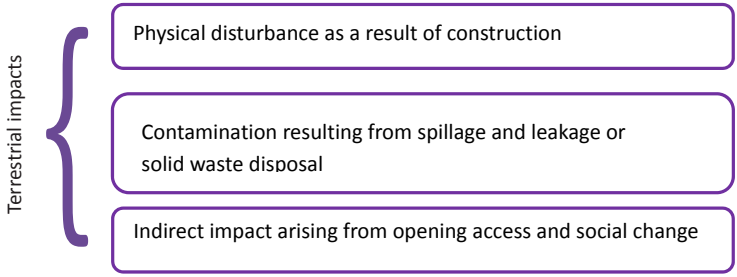

Figure 5. Sources of terrestrial impacts

Exploration and production operations are likely to induce economic, social and cultural changes. The extent of these changes is especially important to local groups, particularly indigenous people who may have their traditional lifestyle affected.

Plant and animal communities may also be directly affected by changes in their environment through variations in water, air and soil/sediment quality and through disturbance by noise, extraneous light and changes in vegetation cover. Such changes may directly affect the environment: for example, habitat, food and nutrient supplies or breeding areas of arctic animals, migration routes, vulnerability to predators or changes in herbivore grazing patterns, which may then have a secondary effect on predators. If controls are not managed effectively, ecological impacts may also arise from other direct anthropogenic influence such as fires, increased hunting and fishing and possibly poaching. In addition to changing animal habitat, it is important to

[1] Arctic Land. Terra Polaris. 2010. http://www.terrapolaris.com/5/arctic/the-arctic-in-general/arktische-landflaechen (accessed 20 February 2017).

[2] Forbes, B. C. et al. 2009. 'High Resilience in the Yamal-Nenets Social-Ecological System, West Siberian Arctic, Russia'. *Proceedings of the National Academy of Sciences* 106 (52): 22041-22048.

consider how changes in the biological environment also affect local people and indigenous populations.[1]

Other complications for sustainable land use are the presence of trash, petrochemicals, noise, and feral dogs near human settlements. If related problems happen it means that much territory is functionally lost. This degradation of territory is in addition to the indirect effects of roads and infrastructure, such as degradation of vegetation, freshwater systems, and increased poaching.[2]

Direct human impacts on Arctic ecosystems may be even more important than climatic change in the next few decades, including disturbance associated with resource exploitation and altered grazing regimes due to changing patterns of reindeer husbandry.[3]

Reduction of pastures through industrial pollution, land withdrawals, and infrastructural encroachment must be understood via their ecological, economic, and social significance.[4]

Photo 9. Human impact. Bely Island. Taken by Andrey Yurtaev, University of Tyumen

[1] Forbes, B. C. et al. 2009. 'High Resilience in the Yamal-Nenets Social-Ecological System, West Siberian Arctic, Russia'. *Proceedings of the National Academy of Sciences* 106 (52): 22041-22048.

[2] Ibid.

[3] Chapin, S. et al. 1997. 'Biotic Control over the Functioning of Ecosystems'. *Science* 277 (5325): 500-504.

[4] Forbes, B. C. et al. 2009. 'High Resilience in the Yamal-Nenets Social-Ecological System, West Siberian Arctic, Russia'. *Proceedings of the National Academy of Sciences* 106 (52): 22041-22048.

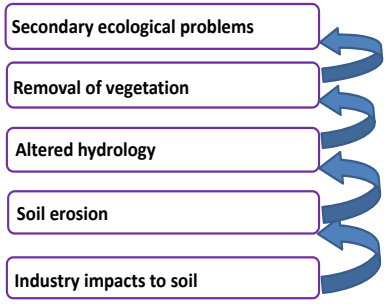

Figure 6. Results of terrestrial impacts

Environmental changes aside, another main effect of industrial development of the Arctic regions is social problems – loss of territories with diverse ecological and cultural significance, decline of traditional activities of the northern indigenous peoples. As in other parts of the Arctic, the extent of indirect impacts greatly exceeds the physical footprint of an oil or gas field complex. Every direct loss of territory has additional indirect social impacts.[1]

Industrial development on the Arctic lands contributes to positive and negative indirect impacts. Each additional road opens up larger areas of the tundra to newcomers who rarely possess either the ecological or cultural knowledge required to behave there in a sustainable manner. Beyond work-related purposes, industrial workers readily exploit roads for illegal hunting and fishing, recreational trips, or trading. Untrained for interactions with herders and reindeer, they can behave in inappropriate ways, e.g., wandering uninvited into camps with cameras, alcohol, etc.[2]

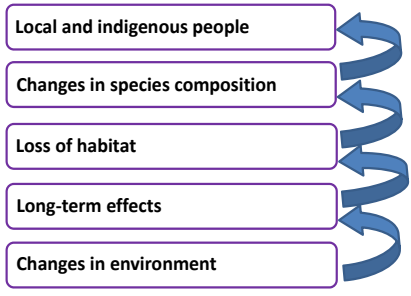

Figure 7. Ecosystem impacts

[1] Forbes, B. C. et al. 2009. 'High Resilience in the Yamal-Nenets Social-Ecological System, West Siberian Arctic, Russia'. *Proceedings of the National Academy of Sciences* 106 (52): 22041-22048.

[2] Ibid.

Photo 10. Changes of the Arctic landscape due to human impact. Bely Island.
Taken by Andrey Yurtaev, University of Tyumen

If land change continues at current rates, land use of the arctic lands may become highly vulnerable. Approximately four million people, including over 30 indigenous groups, populate the Arctic.[1] The biodiversity and aboriginal population of the region is globally unique, so the territories are worth careful protection. The Russian Federation acknowledges the significance of the Arctic region and its impact to sustainability of the planet. As President Vladimir Putin once noted, otherwise "global advantages may turn into global headaches".[2]

Further loss of reindeer pastures through oil production and infrastructure development is the most critical threat. There is hope that modern environmental understanding combined with international participation and investment in production and transportation technology may reduce the potential damage.[3]

[1] Dresser, S. J. 2010. 'Safeguarding the Arctic from Accidental Oil Pollution: the Need for a Binding, Region-specific Shipping Regime'. *Southwestern Journal of International Law* 16: 512.

[2] Russia in the Arctic: Opportunities and Peculiarities of International Cooperation. http://russiancouncil.ru/en/inner/?id_4=2782#top (accessed 2 March 2017).

[3] Environmental Threats. Yamalo-Nenets Autonomous Okrug. http://ansipra.npolar.no/english/Regional%20pages/Yamal_4.html (accessed 20 March 2017).

CHAPTER 3
ARCTIC LEGAL REGIME

"*Legal instruments create a good framework and boards of the current Arctic governance which should be progressively filled with efficient rules specialized on the particular problems of the Arctic*". *The best instrument of legal regulation of this exclusive region could be a correct combination of the international, regional, national law of the Arctic states and international and regional hard law and soft law instruments in the form of guidelines and recommendations and the like. Soft law could be more flexible and promises faster reaction to quickly changing needs of the Arctic conditions. This combination of the various levels of law should become a multilevel governmental platform which is adequately flexible for settled interaction of the varied Arctic problems.*

§ 1. ARCTIC LAW

The Arctic is part of a complex system of political, social, and economic dynamics linking actors inside and outside the region. The region is of tremendous significance, both in terms of its natural resources and in terms of the region's geopolitical standing. The composition of the Arctic is rather complicated in terms of legal regulations – the region embraces eight sovereign states with territorial borders on land and sea, as well as ocean area which falls beyond national jurisdiction. That is the reason for the Arctic law widely recognized as a complex system of fragmented international, regional and national regulations, which are complemented by non-binding soft law mechanisms, usually as a result of Arctic Council initiatives.[1]

[1] International Arctic Law – IntArcticLaw. Arctic Center. University of Lapland. http://www.arcticcentre.org/EN/research/NIEM/Projects/International-Arctic-Law (accessed 2 March 2017).

The Arctic Council, a regional body established by the Ottawa Declaration in 1996, is essentially a political and not a regulatory body.[1] The Council is an intergovernmental forum composed of the eight Arctic states, with membership including the six groups representing the Arctic indigenous peoples. The Arctic Council promotes cooperation, coordination, and interaction among the Arctic states, focusing on issues of the Arctic indigenous communities, Arctic sustainable development and environmental protection. The Council functions through a system of six working groups: 1) Arctic Contaminants Action Program (ACAP); 2) Arctic Monitoring and Assessment Programme (AMAP); 3) Conservation of Arctic Flora and Fauna (CAFF); 4) Emergency Prevention, Preparedness and Response (EPPR); 5) Protection of the Arctic Marine Environment (PAME); and 6) Sustainable Development Working Group.[2]

Box 3. Arctic Council

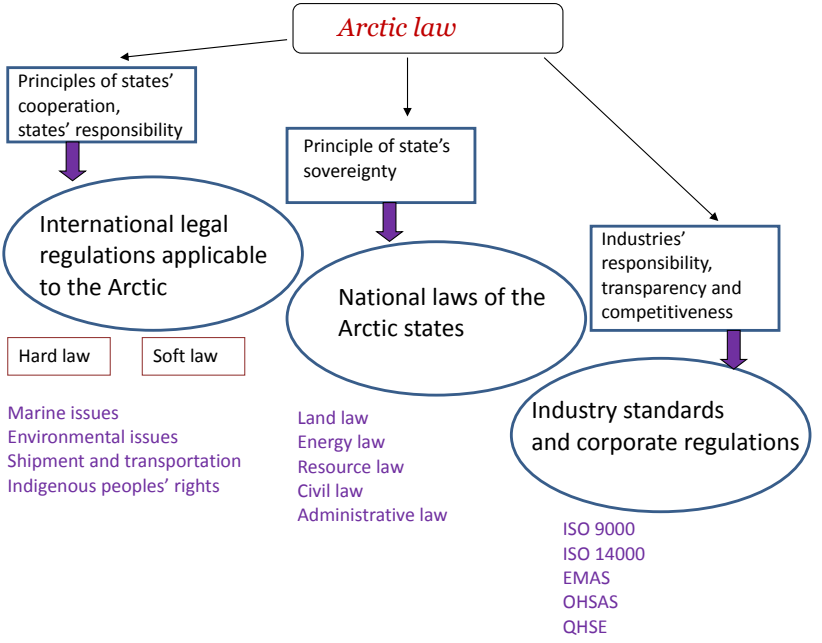

Figure 8. Arctic law

[1] Chircop, A. 2014. 'Regulatory Challenges for International Arctic Navigation and Shipping in an Evolving Governance'. *Environment Ocean Yearbook* 28 (1): 269-290.

[2] *More about the Arctic Council read in Nuttall,* M. 2005. Encyclopedia of the Arctic, vol. I. Publishing Routledge, pp. 117-121.

In general, Arctic law can be divided into four distinct components. The first, ***international hard law***, is identified as legally binding obligations that define the conduct, responsibilities and obligations of states. Flowing from hard law is ***customary law***, or norm evolution developed by states creating certain customs, gradually recognized as a legal requirement. Hard law is effectively "compulsory" law and has often been expressed via treaties.[1] The second, ***soft law*** (or the institutionalization of international norms), is composed of non-legally binding goals and guidelines. Soft law is innovative and flexible, adapting to evolving circumstances. The third element of Arctic law is ***domestic law***, offering deeper insights into how law is affected and shaped by multiple drivers, i.e. states where legal systems function internally. The fourth and final Arctic law component is ***transboundary private law***. It forms during relationship between private persons, natural as well as juridical, primarily in domestic litigation, arising out of situations having a significant relationship to more than one state.[2] Voluntary industry policies and regulations, environmental standards, specific guidelines may be considered as additional components of the Arctic law.

The two main characteristics of the Arctic legal regime are:

1) it is mostly based on non-binding soft law proposing the Arctic states strategies for preventive measures, consistent with the international customs and regulations and regional treaties, regarding the protection of the Arctic's marine environment and on the Arctic states domestic regulations in compliance with soft rules;
2) there is no international treaty or convention aimed to regulate specific types of industrial activities in the Arctic. They are all created for the regulation of different types of activities and pollution that occur in the Arctic Ocean as well as around the globe, but they do not specifically address the Arctic region.

§ 2. INTERNATIONAL REGULATIONS

The Arctic territory can be divided in two different parts: the Arctic Ocean and the Arctic terra firma. Both parts play important role in the international law and whole Arctic law system, but at the same time each of them brings a separate issue of the international law.

There are no hard law treaties that exclusively contend with the Arctic. Some obligatory treaties and conventions are applicable to the Arctic-related issues. The primary example is the United Nations Convention on the Law of the Sea (UNCLOS).[3]

The international legal regime of the Arctic concerns three areas.

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[1] Canuel, E. T. 2015. 'The Four Arctic Law Pillars: a Legal Framework'. *Georgetown Journal of International Law* 46: 736-764.

[2] Ibid.

[3] United Nations Convention on the Law of the Sea. 1992. United Nations Organization official website. http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed 16 March 2017).

1. ***International law regulating the activities of national governments in their use of Arctic waters.*** There are several dimensions of these regulations:

— freedom of the Arctic seas and transportation in the Arctic Ocean;
— offshore resource exploration and development;
— conservation of fisheries and other marine resources;
— prohibitions against marine pollution and dumping;
— safe shipping, carriage and navigation;
— peaceful use of the ocean.[1]

Nearly all international conventions dealing with the protection of the marine environment have some application in the Arctic, which encompasses the world's most northern ocean. These treaties include the **International Convention for the Prevention of Pollution from Ships and its Protocol**, commonly referred to as MARPOL (1973/1978)[2], the **Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter** (1972)[3], and the **United Nations Convention on the Law of the Sea** (UNCLOS, 1982).[4]

The Arctic Ocean is mostly regulated by the unit rules of the UNCLOS. However, only five of the eight Arctic states are parties to this major comprehensive treaty – Iceland, Finland, Norway, Russia and Sweden. Canada, the United States and Denmark have not yet ratified the Convention though they have signed it.

UNCLOS establishes the international legal order of the oceans. The variety of subjects dealt with is covered in a total of 320 articles, divided into seventeen parts, each part dealing with a broad subject concerning the sea. In addition, UNLCOS has nineteen Annexes, each dealing with a specific marine issue.[5]

The purpose of the Convention is to establish rules to govern all uses of the ocean and their resources. Nowadays, UNCLOS defines several categories of the sea regimes from the territorial sea up to the high sea. The territorial sea is defined in the Part II of UNCLOS. It is described as part of sea immediately connecting with state land territory which each of state establishes in the breadth up to a limit not exceeding 12 nautical

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[1] Christopher, C. J. 2009. 'The Legal Regime for the Arctic Ocean'. *Journal of Transnational Law & Policy* 18: 243.

[2] International Convention for the Prevention of Pollution from Ships. 1973. International Maritime Organization official website. http://www.imo.org/en/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol).aspx (accessed 16 March 2017).

[3] Prevention of Marine Pollution by Dumping of Waste and Other Matter. 1972. International Maritime Organization official website. http://www.imo.org/en/About/conventions/listofconventions/pages/convention-on-the-prevention-of-marine-pollution-by-dumping-of-wastes-and-other-matter.aspx (accessed 16 March 2017).

[4] United Nations Convention on the Law of the Sea. 1992. United Nations Organization official website. http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (accessed 16 March 2017).

[5] Robinson, N. A. and Kurukulasuriya, L. 2006. Training Manual on International Environmental Law. http://digitalcommons.pace.edu/lawfaculty/791 (accessed 16 March 2017).

miles measured from baselines. Sovereignty of states fully extends to the territorial sea including to the air space over and bed and subsoil under, it means that the territorial sea is valid part of the coastal state territory under its full jurisdiction.[1] Exclusive economic zone is regulated in the Part V of UNCLOS and it clearly assigns that coastal states has right to use non-living and living natural resources from this area for their economical supports. The zone shall not extend beyond 200 nautical miles from the baseline[2] and states have rights to explore, exploit and research the sea-bed, and duty to protection of the marine environment. The exclusive economic zone does not come under absolute sovereignty of the coastal state as the territorial sea.[3]

Additional legal provisions under UNLOSC apply to the continental shelf, the high seas, and the seabed area. Part XII of UNLOSC addresses protection and preservation of the marine environment. All states are obligated to take measures necessary to prevent pollution from any source and all maritime areas. In addition, all signatory states are to take measures necessary to ensure that activities under their jurisdictions will control and are conducted so as not to cause damage by pollution to other states and their environment. Pollution from a variety of sources is regulated by UNLOSC. States are to adopt domestic laws controlling marine pollution resulting from land-based activities, vessels, and ocean-dumping.

Thus, UNCLOS comprises complex legal regulation of the law of the sea. However, only one special rule particularly relevant to the polar regions exists in this whole Convention. It is Article 234 named '***Ice-Covered Areas***'. The article 234 is also known as "***the Arctic Article***". Currently, the Arctic Ocean comes under the rules of the general international law system like non-sovereign territory and article 234 authorizes coastal states to develop and administer special regulations dealing with human activities in ice-covered waters.

Alongside with UNCLOS the emerging Arctic hard law incorporates the **International Polar Navigation Code** developed under the International Maritime Organization (IMO)[4] which is intended to create a unified code of rules for ships navigation in both polar regions – Arctic and Antarctic. Protocols under the **Convention on Long-range Transboundary Air Pollution** (1979) also contain specific references to the Arctic environment.[5] The Arctic states have universally hailed two Arctic Council agreements as legally-binding instruments. The first is the **Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic** (SAR Agreement, 2011). The Agreement specifies obligations over a broad swath of territory. The Agreement requires Arctic states to provide

[1] Part II. United Nation Convention on the Law of the Sea, 1982.

[2] Art. 57, United Nation Convention on the Law of the Sea, 1982.

[3] Part V. United Nation Convention on the Law of the Sea, 1982.

[4] International Polar Navigation Code. International Maritime Organization official website. http://www.imo.org/en/MediaCentre/HotTopics/polar/Documents/POLAR%20CODE%20TEXT%20AS%20ADOPTED.pdf (accessed 16 March 2017).

[5] Convention on Long-range Transboundary Air Pollution. 1979. UNECE. https://www.unece.org/fileadmin/DAM/env/lrtap/full%20text/1979.CLRTAP.e.pdf (accessed 16 March 2017).

rescue assistance to individuals, regardless of nationality or circumstance, with each Arctic state conducting searches within a designated geographical area of responsibility and establishing Rescue Coordination Centers.[1] In addition to conducting search and rescue operations, the Arctic states are also required to collaborate on preparatory activities and share information on capabilities and data.[2] The Arctic Council's **Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic**[3] (2013) also carves out numerous state obligations.

2. International environmental law

Two competing principles of international environmental law are the core foundation of the Arctic legal regime: 1) ***states' sovereignty over their natural resources***, i.e. the right of nations to self-determination and development of their resources; 2) the doctrine that ***states have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or areas beyond the limits of national jurisdiction***. Arctic countries with big oil and gas reserves balance the strength of their sovereign right to exploit oil and gas in the northern territories with their obligation to avoid environmental harm to the fragile Arctic environment which is valuable for the world community.

Two universally recognized, though nonbinding, environmental documents regulating environmental issues are the **Rio Declaration on Environment and Development**[4] and **Agenda 21**.[5] Both were adopted at the United Nations Conference on Environment and Development (UNCED), or Earth Summit, in Rio de Janeiro in June 1992.[6] The Rio Declaration on Environment and Development is a statement of 27 principles for sustainable development. Agenda 21 is a global plan of action for sustainable development. By agreeing to these texts, countries agreed to foster sustainable development within their own boundaries as well as internationally. The Rio Declaration affirms the premise of development that every human being is "entitled to a healthy and productive life", but it adds "in harmony with nature".[7] Thus, environmental protection is to be incorporated into our understanding of what progress requires. Prominent principles of the Rio

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[1] Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic, May 12, 2011. *International Legal Materials* 50: 1119.

[2] Canuel, E. 'The Four Arctic Law Pillars: A Legal Framework'. *Georgetown Journal of International Law* 46: 736-762.

[3] Agreement on Cooperation on Marine Oil Pollution, Preparedness and Response in the Arctic. 2013. EPPR. Arctic Council official website. https://arctic-council.org/eppr/agreement-on-cooperation-on-marine-oil-pollution-preparedness-and-response-in-the-arctic (accessed 16 March 2017).

[4] Rio Declaration on Environment and Development. 1992. United Nations Organization official website. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm (accessed 10 March 2017).

[5] Agenda 21. United Nations. Sustainable Development. https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf (accessed 10 March 2017).

[6] UN Conference on Environment and Development. 1992. United Nations official website. http://www.un.org/geninfo/bp/enviro.html (accessed 10 March 2017).

[7] Rio Declaration on Environment and Development. 1992. United Nations Organization official website. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm (accessed 10 March 2017).

Declaration are the sovereign authority of nations to use their own natural resources and the responsibility of countries to "ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction". Other principles would require integration of the environment into all decision-making, a precautionary approach to serious environmental risks, internalization of environmental costs by polluters (polluter-pays principle), citizen participation in government decision-making, reduction and elimination of unsustainable patterns of production and consumption, and common but differentiated responsibilities of developed and developing countries in sustainable development. All these principles are applicable to the Arctic development.

Agenda 21 recommends ways to address environmental degradation and further sustainable development. The Agenda 21 commitment is not binding in international law, but it does represent a political commitment. As a plan of action, Agenda 21 is divided into 4 sections and a total of 40 chapters. Agenda 21 is based to a great extent on the 27 principles stated in the Rio Declaration. Agenda 21 and the Rio Declaration should thus be read together.[1]

All eight Arctic countries have signed and ratified the Rio Declaration. European countries have even elaborated their own Local Agenda 21. Local Agenda 21 is a local-government-led, community-wide, and participatory effort to establish a comprehensive action strategy for environmental protection, economic prosperity and community well-being in the local jurisdiction or area. This requires the integration of planning and action across economic, social and environmental spheres. Key elements are full community participation, assessment of current conditions, target setting for achieving specific goals, monitoring and reporting.[2]

Consistently applying the principles and provisions of the Rio Declaration and Agenda 21 to the Arctic development governments may lead to the protection of the entire range of natural resources and ecosystems from every significant impacts of industrial development. A basic objective is to ensure that their use does not degrade or diminish resources. Environmental and natural resource goals are thus linked, with the use of resources to serve human needs.

Two treaties that are directed at sustainable development were also opened for signature at the UNCED – the UN **Framework Convention on Climate Change**[3] and the **Convention on Biological Diversity** also known as "Biodiversity Convention" created as a hard law instrument[4] with a framework character.

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[1] Dernbach, J. C. 2002. *Stumbling Toward Sustainability.* Washington: Environmental Law Institute, p. 50.

[2] Urban Environmental Management. Local Agenda 21. https://www.gdrc.org/uem/la21/la21.html (accessed 10 March 2017).

[3] Framework Convention on Climate Change. 1992. The UNFCCC website. http://unfccc.int/2860.php (accessed 10 March 2017).

[4] Convention on Biological Diversity. 1992. The CDD website. https://www.cbd.int/doc/publications/CBD-10th-anniversary.pd (accessed 10 March 2017).

The Convention on Biological Diversity, known informally as the Biodiversity Convention, is an international legally binding treaty. The Convention has three main goals:

1) conservation of biological diversity (or biodiversity);

2) sustainable use of its components; and

3) fair and equitable sharing of benefits arising from genetic resources.

Thus, the legal responsibility of the Arctic states, parties to the Convention, is to guarantee the preservation of biological diversity in the Arctic. This objective can be achieved through changing domestic legislation, developing national strategies for the conservation and sustainable use of biological diversity, special state programs focused on biodiversity, expanding the protected areas. The Arctic states except the USA are parties to the Biodiversity Convention.

All Arctic states have agreed to protect a minimum of 12 % of each Arctic ecozone. The Arctic Council Working Group on the conservation of Arctic flora and fauna (CAFF) has completed a Strategy and Action Plan for the Circumpolar Protected Areas Network (CPAN). The CPAN Strategy and Action Plan suggests that countries use the IUCN Protected Areas classification system to develop a regional network of protected areas, and urges countries to try to provide strict protection for at least 12 % of each eco-zone within the Arctic.[1] No specific terrestrial or marine sites are recommended. Another CAFF document, the strategic plan for the conservation of Arctic biological diversity, recognizes that most of the Arctic territory will remain outside protected areas. The current level of protection varies from a low of 4,9 % of Russia's Arctic land mass, to 45,7 % of Greenland/ Denmark's land mass.[2]

Box 4. Arctic land conservation

Alongside with the Biodiversity Convention there are several international agreements related to protected areas which are relevant to the Arctic. All Arctic states are parties to the **Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat**[3] (1971); all states except Iceland are parties to the **World Heritage Convention**[4] (1972). However, only two of the Arctic states, Norway and Sweden, are parties to the **Convention on the Conservation of Migratory Species of Wild Animals**[5] (the Bonn Convention also known as "CMS", 1979).

[1] VanderZwaag, D. 1997. 'International Law and Arctic Marine Conservation and Protection: A Slushy, Shifting Seascape'. *Georgetown International Environmental Law Review* 9: 303 ed., p. 316.

[2] Nowlan, L. 2001. *Arctic Legal Regime for Environmental Protection.* IUCN Environmental Policy and Law Paper No. 44. IUCN – The World Conservation Union.

[3] Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971. UNESCO website. http://portal.unesco.org/en/ev.php-URL_ID=15398&URL_DO=DO_TOPIC&URL_SECTION=201.html (accessed 10 March 2017).

[4] Convention Concerning the Protection of the World Cultural and Natural Heritage. 1972. UNESCO website. http://whc.unesco.org/en/conventiontext (accessed 10 March 2017).

[5] Convention on the Conservation of Migratory Species of Wild Animals. 1983. CMS website. http://www.cms.int (accessed 10 March 2017).

Above documents of UNCED, there are five primary global treaties regulating environmental matters with relevance to the Arctic region: the **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal**[1] (1989), the **Vienna Convention for the Protection of the Ozone Layer**[2] (1985), the **Montreal Protocol on Substances that Deplete the Ozone Layer**[3] (1989), the **Kyoto Protocol to 1992 United Nations Framework Convention on Climate Change**[4] (1997), and the **Convention on Environmental Impact Assessment in a Transboundary Context**[5] (1991).

THE BASEL CONVENTION

The Basel Convention regulates the international shipment of hazardous waste. It seeks "to directly stop international trade in waste destined for disposal in countries which do not have regulatory infrastructure, and which cannot ensure environmental sound management of such disposal". The Basel Convention requires an exporting nation to inform an importing nation of the amount and content of the hazardous waste and to obtain written consent from the importing nation that it will accept such a shipment.
To prevent circumvention of this system, a country which is not a party to the agreement may not export or import hazardous wastes to or from parties unless it does so pursuant to a separate multilateral or bilateral agreement. Furthermore, each party to the agreement must prohibit persons within its jurisdiction from transporting hazardous waste unless they are authorized, and then, only when in compliance with the specific rules. Forty nations have ratified this treaty, including all of the world's industrialized nations, except the United States and New Zealand.

THE VIENNA CONVENTION AND MONTREAL PROTOCOL

The Vienna Convention obligates countries to take measures to "protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer. It provides a list of chemical substances which have the potential to modify and deplete the properties of the ozone layer". In addition, the

Box 5. Multilateral Environmental Agreements

[1] The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. 1989. The Basel Convention Home Page. http://www.basel.int (accessed 10 March 2017).

[2] The Vienna Convention for the Protection of the Ozone Layer. 1985. UNEP official website. OZONE Secretariat. http://ozone.unep.org/en/treaties-and-decisions/vienna-convention-protection-ozone-layer (accessed 10 March 2017).

[3] The Montreal Protocol on Substances that Deplete the Ozone Layer. 1987. UNEP official website. OZONE Secretariat. http://ozone.unep.org/en/treaties-and-decisions/montreal-protocol-substances-deplete-ozone-layer (accessed 10 March 2017).

[4] Kyoto Protocol. 1997. The UNFCCC website. http://unfccc.int/kyoto_protocol/items/2830.php (accessed 10 March 2017).

[5] Convention on Environmental Impact Assessment in a Transboundary Context. 1991. UNECE official website. http://www.unece.org/env/eia/welcome.html (accessed 10 March 2017).

Vienna Convention requires participating countries to adopt legislative measures to control and limit the behavior of individuals within a state's jurisdiction to prevent them from conducting activities which are shown to cause further depletion of the ozone layer. The participants also agreed to cooperate in the research effort to determine which human activities effect the depletion of the ozone layer, although individual participating countries have the latitude to exploit their own resources in accordance with their own environmental policies.
In 1987 the Montreal Protocol amended the Vienna Convention by specifically providing for the parties' gradual reduction in the production and consumption of chlorofluoro-carbons (CFCs) and other chemical substances. The Montreal Protocol also set controls on the trade of such chemicals with non-parties.

CLIMATE CHANGE TREATY AND KYOTO PROTOCOL

The Climate Change Treaty seeks to stabilize greenhouse gas concentrations to prevent them from reaching levels which could threaten the climate system. The developed countries who are parties to the agreement obligate themselves to take the lead in dealing with this climate control problem by promising to implement national policies and to take the corresponding measures to help assist in the reduction of greenhouse gas emissions. Despite the obligations imposed by the Climate Change Treaty, it placed no legally binding requirements on the parties. The Kyoto Protocol of 1995, however, amended the Climate Change Treaty by imposing the specific legal requirements that the initial agreement lacked. In particular, the Kyoto Protocol requires 39 specific industrialized and developed countries to reduce the emissions of greenhouse gases to five percent below 1990 levels between the years 2008 and 2012, although it specifically declines to extend the reduction of emissions requirement to developing countries.

THE CONVENTION ON ENVIRONMENTAL IMPACT ASSESSMENT

The Convention on Environmental Impact Assessment addresses environmental problems that arise when one country's activity impacts the environment of a neighboring country. The treaty lists 17 activities believed to have the potential to affect the environment outside the borders of the country where the activity originates. Parties to the treaty must take appropriate measures to prevent and control the environmental impact from those activities identified in the treaty as having this potential for transboundary environmental effects. The parties must notify any party that could be affected by the environmentally unsafe activity, and must implement an impact assessment procedure which permits public participation and preparation of the necessary documentation.

Box 5. Continued

3. Land-based pollution regulations

Land-based pollution is the least regulated form of marine pollution. Experts estimate that approximately 80 % of the pollution load in the oceans originates from land-based activities, including municipal, industrial and agricultural wastes and run-offs as well as atmospheric depositions.[1] Though the estimates of 80 % do not likely apply in the Arctic because of the relatively low population inhabiting the area, there are nonetheless

[1] Boyle, Cf. A. E. 1992. 'Land-based Sources of Marine Pollution: Current Legal Regime'. *Marine Policy* 16: 20-21.

many land-based sources resulting from urban areas, oil and gas operations, industrial complexes.[1]

At present, the UNLOSC (1982) is the only treaty which provides general obligations to prevent land-based pollution at the global level. In this respect, Article 194 (1) obliges states to take all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source , using for this purpose the best practicable means at their disposal and in accordance with their capabilities. It is apparent that land-based pollution is covered by this provision.[2] Article 194 (2) further imposes a duty upon states to take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other states and their environment; and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with the UNLOSC. In addition, Article 194 (3) (a) stipulates that measures taken pursuant to Part XII shall include, inter alia, those designed to minimize to the fullest possible extent "the release of toxic, harmful or noxious substances, especially those which are persistent, from land-based sources, from or through the atmosphere or by dumping".

Soft law is also important in regulations of land-based pollution. Some attempts have been made to develop a global legal instrument relating to the land-based pollution particularly under the auspices of UN Environmental Program.[3] An important outcome was the adoption of the **Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources** (1985).[4] While the Montreal Guidelines are of a voluntary nature, it is noteworthy that they specify the measures to be taken in order to "prevent, reduce and control" pollution from land-based sources in detail.[5] In fact, the Montreal Guidelines enumerates various measures which should be taken by each State. Such measures contain: environmental impact assessment, monitoring, notification, information exchange and consultation, scientific and technical co-operation, assistance to developing countries, development of control strategies etc. In this respect,

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[1] Tanaka, Y. 2006. 'Regulation of Land-Based Marine Pollution in International Law: A Comparative Analysis Between Global and Regional Legal Frameworks'. *ZaöRV / Heidelberg Journal of International Law* 66: 535-574.

[2] Ibid.

[3] Mensah, T. A. 1999. The International Legal Regime for the Protection and Preservation of the Marine Environment from Land-Based Sources of Pollution. In: Boyle, A. / Freestone, D. (eds.) *International Law and Sustainable Development: Past Achievements and Future Challenges*, Oxford, pp. 297-324.

[4] The 1985 Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-Based Sources, 1 (b). In: Hohmann, H. (ed.) *Basic Documents of International Environmental Law*, vol. I, London et al. 1992, pp. 130-147.

[5] Meng, Q.-N. 1987. *Land-Based Marine Pollution: International Law Development*, London et al., pp. 163-215.

it is interesting to note that the 1985 Montreal Guidelines stress the need for "a comprehensive environmental management approach".[1]

Land-based pollution was recognized as a problem by the Arctic Council which continues to focus on addressing these sources of pollution. An additional global soft law agreement, the Global Program of Action for the Protection of the Marine Environment from Land-Based Activities was concluded in 1995. The Global Program of Action (GPA) calls upon states to develop national level plans to address land-based sources of pollution which enter the marine environment.[2]

Owing to the economic, technological and geographical divergence in the world, it appears difficult to establish uniform and detailed rules regulating land-based pollution at the global level. Accordingly, it becomes necessary to tailor any rules preventing marine pollution from land-based sources in the Arctic region which is more and more exploited. Without regulating pollution in internal waters, measures to regulate land-based marine pollution could not be fully effective. States may adopt measures which are either more or less stringent than those embodied in international law. In this sense, control by internationally agreed criteria upon national standards remains modest.[3] Moreover, it is also a matter for the judgment of each state what measures shall be taken. The territorial sovereignty of a state is dominant in the regulation of land-based pollution under the UNLOSC, and the balance between national and international laws is clearly in favor of national laws.[4]

§ 3. INDUSTRY REGULATIONS

The international exploration and production industry has made its own contribution to the principle of sustainable development at the international level by taking independent action to promote a good level of environmental performance through the establishment of industry guidelines and various international business charters. However, such guidelines are not always applicable from area to area, region to region, or ecosystem to ecosystem, and they should be applied with due regard to specific circumstances. Indi-

[1] *On this issue, see:* Burchi, S. 1977. 'International Legal Aspects of Pollution of the Sea from Rivers'. *Italian Yearbook of International Law* 3: 115-142; de Villeneuve, C. H. V. 1998. 'The Contribution of Regional River Treaties to the Protection of the North Sea'. *IJMCL* 133: 73-378; Tsukikawa, K. 1997. *Protection of the Marine Environment and the Prevention of Pollution (in Japanese)*, Tokyo, 96-105; Ando, N. 1981. The Law of Pollution Prevention in International Rivers and Lakes. In: Zacklin, R. / Caflisch, L. (eds.) *The Legal Regime of International Rivers and Lakes*, The Hague et al., p. 351.

[2] Nowlan, L. 2001. *Arctic Legal Regime for Environmental Protection.* IUCN Environmental Policy and Law Paper No. 44. IUCN – The World Conservation Union.

[3] Nordquist, M. H. (ed.). 1991. *United Nations Convention on the Law of the Sea 1982: A Commentary*, vol. IV, Dordrecht, p. 32.

[4] Yankov, A. 1999. The Law of the Sea Convention and Agenda 21: Marine Environmental Implications. In: Boyle, A. / Freestone, D. (eds.) *International Law and Sustainable Development: Past Achievements and Future Challenges*, Oxford, p. 280.

vidual companies are increasingly adopting policies and codes to guide their personnel, contractors and suppliers. Government regulations and enforcement nevertheless remain the cornerstone for protection of the environment, not least because of the difficulty of monitoring and enforcing voluntary industry codes.[1]

Environmental groups and the general public have become increasingly vocal over environmental concerns and increasingly effective in persuading lawmakers to adopt tougher environmental standards.[2] Companies that do not comply with these new rules are at a competitive disadvantage. To ensure adherence to sound environmental practices, international organizations are increasingly emphasizing the importance of environmental standards for industrial companies. That is the reason why international standards for environmental management are being actively developed and widely applied. It's true for the fragile Arctic region where the environmental consequences should be thoroughly evaluated. Environmental standards is an attempt to help oil and gas companies formulate effective corporate environmental policies based on the necessity of ensuring environmental safety and the minimization of negative environmental consequences.

The present focus for most industries is on the ISO series of international environmental management standards. The International Organization for Standardization (ISO) is a global federation of national standards bodies, comprising over 100 members, one per country. ISO's purpose is to "promote the development of standardization and related activities in the world with a view to facilitating international exchange of goods and services, and to developing cooperation in the sphere of intellectual, scientific, technological and economic activity".[3]

The corporate environmental standards that are mostly used in the Arctic industrial projects are the ISO 9000 Quality Management Standards, the ISO 14000 Environmental Management Standards, EMAS and OHSAS. OHSAS is an Occupation Health and Safety Assessment Series[4] for health and safety management systems. It is intended to help organizations to control occupational health and safety risks.

For example, EMAS requires an environmental compliance program, which it defines as "a management tool comprising a systematic, documented, periodic and objective evaluation of the performance of the organization, management system and processes designed to protect the environment, with the aim of assessing compliance with company policies".[5]

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[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[2] Hall, R. M. Jr. and Tockman, K. A. 1995. 'International Corporate Environmental Compliance and Auditing Programs'. *Environmental Law Reporter* 25: 10396.

[3] Wray, H. A. (ed.). 1992. *Manual on Flash Point Standards and Their Use: Methods and Regulations.* American Society for Testing and Materials. Library of Congress, p. 137.

[4] What is Occupational Health and Safety Assessment Series (OHSAS 18001) & Should I Care? Managing Risk. DNV. http://coss.net/Docs/cosm/StrategicPlanningandProgEval/OHSAS18001Q&A.pdf (accessed 17 March 2017).

[5] Hall, R. M. Jr. and Tockman, K. A. 1995. 'International Corporate Environmental Compliance and Auditing Programs'. *Environmental Law Reporter* 25: 10397.

§ 4. SOFT LAW

Soft law is a legal phenomenon in international law which refers to the non-binding international agreements or norms. Although soft law is non-binding, it is not completely void of legal significance.[1] The concept of soft law has developed from the notion that resolutions and recommendations of international organizations gradually acquire some legal value. The basic role of soft law is to raise expectations of conformity with legal norms, and to create uniformity in the creation of these norms. Soft law is especially significant in the environmental law context because a plethora of nongovernmental organizations exist which attempt to create new regulations by suggesting soft law instruments.[2] Soft law can be useful in an area without a long history of international cooperation, like the Arctic. Soft law requires neither formal procedures of ratification, nor the passage of domestic implementing legislation. Both these processes can take time, and may be difficult to achieve due to political constraints. Treaty making may involve serious constitutional or legislative barriers. Negotiating soft law instruments will usually be quicker, and provisions in these agreements take effect immediately.[3] Once there is compliance with a uniform legal norm, the formation of binding hard law is a relatively simple task.

The Ottawa Declaration (1996), establishing the Arctic Council[4], is a prime example of soft law. The Declaration calls for promoting cooperation, coordination, and interaction among the Arctic states on common Arctic issues, in particular sustainable development and environmental protection. The consensus-based Arctic Council is soft law in action.[5]

Another example of soft law regulations for the Arctic is the Global Program of Action for the Protection of the Marine Environment from Land-Based Activities[6] concluded in 1995 which elaborates the Article 207 of UNLOSC for the further development of international regulation to reduce land-based pollution. The Arctic Environmental Protection Strategy which was signed in 1991 is also a flexible agreement that is not legally binding, but may in future become so.[7]

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[1] Amos, A. 2016. The Impact of "Soft Law" in International Economic Law, The NewJurist. http://newjurist.com/the-impact-of-soft-law-in-international-economic-law.html#sthash.ZX3KBtez.dpuf (accessed 17 March 2017).

[2] Pollock, J. M. and Jemison, J. S. 1999. *The Emerging of International Environmental Law*, New Jersey State Bar Association.

[3] Kiss, A. 2000. Commentary and Conclusions. In: Shelton, D. (ed.) *Commitment and Compliance: the Role of Non-Binding Norms in the International Legal System,* Oxford University Press, p. 239.

[4] Declaration on the Establishment of the Arctic Council. 1996. *International Legal Materials* 35: 1387.

[5] Canuel, E. T. 2015. 'The Four Arctic Law Pillars: a Legal Framework'. *Georgetown Journal of International Law* 46: 736-764.

[6] Global Program of Action for the Protection of the Marine Environment from Land-Based Activities. UN Environment. http://web.unep.org/gpa (accessed 17 March 2017).

[7] Arctic Environmental Protection Strategy. Arctic Portal Library. http://library.arcticportal.org/1542/1/artic_environment.pdf (accessed 17 March 2017).

Moreover, the Arctic Council has generated important guidelines, including the **Arctic Offshore Oil and Gas Guidelines** (2009) and the **Arctic Marine shipping Assessment** (2009). Non-binding rules that constitute soft law include the International Maritime Organization's Polar Code, which provides voluntary shipping guidelines and regulations for ships crossing polar waters.[1]

Discussing sustainable development, soft law plays a central role in creating consensus over certain principles and further identifying and building alliances to contribute to future sustainable development hard law.[2]

§ 5. STATE SOVEREIGNTY OVER ARCTIC TERRITORIES

All land areas of the Arctic fall under the sovereignty of one of the eight Arctic states (Canada, Denmark/Greenland, Finland, Iceland, Sweden, Norway, Russia and the United States) and so national domestic laws contain the primary legal controls on the resource development, environment, tourism, indigenous issues, etc. However, international laws and principles play an increasing role in this legal regime.

The concept of a state's sovereignty over its natural resources is rooted in the old customary principle of territorial sovereignty; the United Nations General Assembly has further encouraged its declaring.[3] The principle means that the right of peoples and nations to permanent sovereignty over their natural resources and wealth must be exercised in the interest of their national development, and of the well-being of the people of the state. Sovereignty over natural resources is permanent and it is as an international right. It has been accepted by tribunals and affirmed in international agreements.[4] So, generally speaking, the state is free to regulate oil and gas activities according to its sovereign will and state policy and regime and there is no opportunity for other states to interfere with these regulations whatever their attitude to it.

The sovereignty of eight Arctic states extends, beyond their land territory and their internal waters, to a belt of sea adjacent to their coast, described as the territorial sea, the exclusive economic zone, and a continental shelf. The continental shelf of a coastal state comprises the submerged prolongation of the land territory of the coastal state – the seabed and subsoil of the submarine areas that extend beyond its territorial sea to the outer edge of the continental margin.

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[1] Canuel, E. T. 2015. 'The Four Arctic Law Pillars: a Legal Framework'. *Georgetown Journal of International Law* 46: 736-764.

[2] Canuel, E. T. 2016. 'Sustainable Development, Natural Resource Extraction, and the Arctic: The Road Ahead'. *Alaska Law Review* 33 (1): 34.

[3] Soto, M. V. 1996. 'General Principles of International Environmental Law'. *ILSA Journal of International & Comparative Law* 3: 193.

[4] Philippe, S., Peel, J., MacKenzie, R. 2012. *Principles of International Environmental Law.* Cambridge University Press, p. 192.

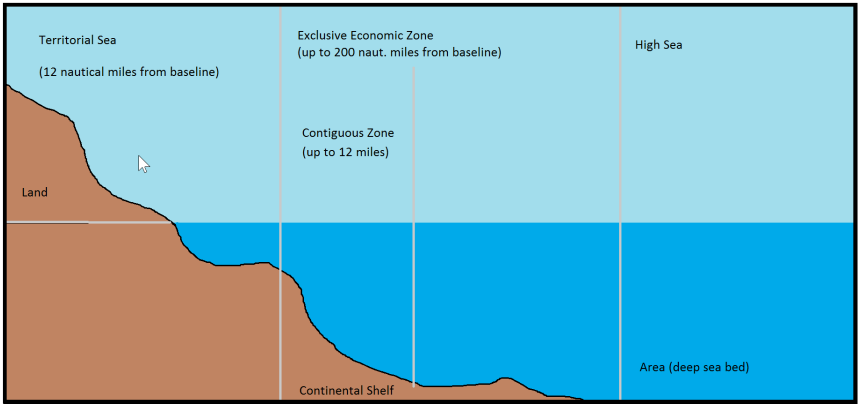

Figure 9. Areas of the jurisdiction

The concept of sovereignty is not absolute. Each state has exclusive legislative, judicial, and executive jurisdiction over activities on its territory. However, states are obliged to exercise broad control over public and private activities, and this necessarily places legal limits to their freedom of action. Every state is subject to a general duty not to cause environmental damage to the environment of other states, or to areas beyond a state's national jurisdiction.[1] As stated in the Rio Declaration: states have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or areas beyond the limits of national jurisdiction.[2]

States have different degrees of responsibility and power depending on which territorial zone activities take place in. Within a state's internal waters, a coastal state has absolute sovereignty. Within the territorial sea zone, no farther than 12 nautical miles from the baseline, a coastal state still retains complete sovereignty but must allow innocent right-of-passage to foreign ships. Intended and serious marine pollution and unauthorized fishing are acts inconsistent with innocent passage.[3] Within a contiguous

[1] Kiss, A. and Shelton, D. 2007. *Guide to International Environmental Law.* Koninklijke Brill NV, Leiden, the Netherlands.

[2] Rio Declaration on Environment and Development. 1992. United Nations Organization official website. http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm (accessed 10 March 2017).

[3] CAFF. 2000. Habitat Conservation Report No. 8: *A Summary of Legal Instruments and National Framework for Arctic Marine Conservation*, CAFF International Secretariat, p. 7.

zone, a state has sovereign rights and exercises powers over customs, physical immigration or sanitary laws and regulations. And within the exclusive economic zone, a coastal state has sovereign rights for the purposes of exploring, exploiting, conserving and managing both living and non-living natural resources of the seabed, its sub-soil and the waters above it and with regard to other activities for the economic exploitation and exploration of the zone. Within this zone, the coastal state determines allowable the catch of living resources and harvest limits, if any, for these resources. Any other state which is allowed to harvest marine living resources must abide by the laws and regulations adopted by the coastal state.[1]

Based on these principles, as well as on the Article 234 of UNCLOS the Arctic states regulate a wide range of issues concerning the Arctic: land law, energy law, resource law, civil law, administrative law as well as indigenous regulations.

§ 6. DOMESTIC LAW

Typically, states create an extensive system of laws and regulations that govern industry performance and environmental issues. Examples of common legislation that may apply to the Arctic use and protection:

— Petroleum laws;
— Planning laws;
— Environmental protection laws;
— Environmental impact assessment;
— Clean air and water acts;
— Water catchment protection;
— Discharge and management of wastes;
— Marine pollution control;
— Standards for noise, radiation, chemical exposure;
— Integrated pollution control;
— Land contamination or land disturbance;
— Permitted chemicals;
— Safety and fire regulations;
— Control of major hazards;
— Storage and usage of chemicals;
— Public and worker health and safety;
— National protected area laws;
— Forest protection laws;
— Protection of indigenous and cultural heritage;
— Fishery protection, marine navigation and safety.

[1] Nowlan, L. 2001. *Arctic Legal Regime for Environmental Protection.* IUCN Environmental Policy and Law Paper No. 44. IUCN – The World Conservation Union.

The eight Arctic countries have all put forth Arctic strategies. They describe their policy objectives for all areas of the Arctic development, use and protection.

Canada has two main documents outlining its Arctic strategy: "Our North, Our Heritage, Our Future: Canada's Northern Strategy" and "Statement on Canada's Arctic Foreign Policy". The latter was released in August 2010 and it establishes four areas where Canada is taking action to advance its interests both domestically and internationally and to help unlock the North's true potential: exercising sovereignty; promoting economic and social development; protecting the environmental heritage; and improving and devolving Northern governance.[1]

The three parts of the Kingdom of Denmark – Denmark, Greenland and the Faroe Islands – share a number of values and interests, and all have a responsibility to the Arctic region. The Arctic policy of the Kingdom was laid out in August 2011 in the "Strategy for the Arctic 2011-2020". According to the Strategy, the Kingdom will work in close cooperation with their international partners toward a peaceful, secure and safe Arctic with self-sustaining growth and development with respect for the Arctic's fragile climate, environment and nature.[2]

In August 2010, the Prime Minister's Office in Finland published Finland's Strategy for the Arctic Region. The priority areas of Finland's policy in the Arctic are environmental protection, economic activities, transport networks, indigenous peoples, and international cooperation.[3]

Iceland does not have a detailed strategy, but in 2011 its Parliament approved "A Parliamentary Resolution on Iceland's Arctic Policy" which lists twelve principles (plus commentary) on which Icelandic policy will stand.[4]

The Norwegian Government's Strategy for the High North, published by the Government of Norway in 2007, sets the overall objective to create sustainable growth and development of the Arctic territories. The priority areas are "to exercise Government authority in the High North in a credible, consistent and predictable way; to develop knowledge in and about the High North; to be the best steward of the environment and natural resources; to provide a suitable framework for further development of petroleum activities in the Barents Sea; to play a role in safeguarding the livelihoods, traditions and cultures of indigenous peoples; and to develop cooperation in the North".[5]

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[1] Canada Arctic Foreign Policy. http://www.international.gc.ca/arctic-arctique/arctic_policy-canada-politique_arctique.aspx?lang=eng (accessed 10 February 2017).

[2] Denmark, Greenland and the Faroe Islands: Kingdom of Denmark Strategy for the Arctic 2011-2020. http://ec.europa.eu/enterprise/policies/raw-materials/files/docs/mss-denmark_en.pdf (accessed 10 February 2017).

[3] *For more details see the text of* the Finland's Strategy for Arctic Region. http://formin.finland.fi/public/download.aspx?ID=63216&GUID=%7BC92863F7-1188-4975-9CC8-34EA16C26D07%7D (accessed 10 February 2017).

[4] Recinos, R. E. 2012. *A Summary of Environmental Strategies of the Arctic Nations,* Claremont McKenna Colledge – Claremont CA, USA.

[5] The Norwegian Government's Strategy for the High North. http://www.regjeringen.no/upload/Ud/Vedlegg/strategien.pdf (accessed 10 February 2017).

The "Foundations of Russian Federation Policy in the Arctic until 2020 and beyond" was published in the end of March, 2009. The document prioritizes the utilization of the Arctic zone as a national strategic resource base in order to meet the socio-economic objectives associated with national growth.[1] Russia strives to meet the international requirements to preserve and protect the ecosystems of the Arctic by changing domestic legislation, for example:

1) it guarantees the conservation of biological diversity in the Arctic, partially by expanding protected natural areas;

2) it implements the measures of adaptation of the Arctic environments to climate change and increased industrial activity;

3) it introduces cleaning and pollution prevention measures.

According to Sweden's Strategy for the Arctic Region (adopted in May 2011), Swedish priorities in the Arctic include climate and the environment, economic development, and the human dimension (health, climate change and hazardous substances, impact on indigenous cultures and industries, and knowledge transfer).[2]

The United States' Arctic policy was originally established in the Arctic Research and Policy Act of 1984 (ARPA), which has since been amended. The Act acknowledges both the importance of the Arctic and the United States' interests there. A framework is set up to "establish national policy, priorities, and goals and to provide a Federal program plan for basic and applied scientific research with respect to the Arctic, including natural resources and materials, physical, biological and health sciences, and social and behavioral sciences…".[3] The country affirms its intensions towards the responsible handling of the Arctic environment.[4] In May 2013, the President of the United States signed the National Strategy for the Arctic Region which set forth the United States Government's strategic priorities for the Arctic. The Strategy is built on three lines of effort: 1) the United States security interests; 2) responsible Arctic region stewardship; 3) international cooperation.[5]

Domestic regulations of the arctic issues in five coastal Arctic States are rather diverse. Most of the countries do not have specific laws regulating the Arctic resources and environment. They prefer to regulate special areas of resource use like oil and gas development on continental shelf or relevant activities. Some Arctic states, however, adopt laws addressing arctic issues, like Canada, or develop special strategies and conceptions which can further transfer to Arctic laws and regulations (like in Russia).

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[1] The Foundations of Russian Federation Policy in the Arctic until 2020 and Beyond, The Strategy of the Arctic Zone Development and National Security of the Russian Federation and for the Period until 2020. http://www.government.ru (accessed 20 February 2017).

[2] Sweden's Strategy for the Arctic Region. http://www.government.se/content/1/c6/16/78/59/3baa039d.pdf (accessed 10 February 2017).

[3] National Strategy for the Arctic Region. http://www.whitehouse.gov/sites/default/files/docs/nat_arctic_strategy.pdf (accessed 10 February 2017).

[4] Recinos, R. E. 2012. *A Summary of Environmental Strategies of the Arctic Nations,* Claremont McKenna Colledge – Claremont CA, USA.

[5] National Strategy for the Arctic Region. http://www.whitehouse.gov/sites/default/files/docs/nat_arctic_strategy.pdf (accessed 10 February 2017).

Environmental regulations may be found under a variety of national laws. In some cases these are included in clauses inserted into petroleum laws and planning laws; in others, specific legislation has been developed dealing with such matters as environmental assessment, pollution, water and air quality, protection of waterways, environmental health and safety, protected areas, nuisance and noise.[1]

Petroleum laws rarely impose detailed requirements for environmental control program, but do provide the framework for subordinate regulations incorporating, for example, a requirement to prepare environmental assessments, plans for waste disposal and control of emissions and discharges, preparation of emergency plans, control of hazardous substances, and reclamation and rehabilitation of sites at completion of operations and following accidents.[2]

Table 2

Legal and administrative framework of environmental protection in the Arctic countries

Arctic country	Government agency	Regulations specific to Arctic oil and gas use	Regulations specific to Arctic environment
USA	— Department of the Interior – Bureau of Safety and Environmental Enforcement — Environmental Protection Agency — U.S. Coast Guard	— Outer Continental Shelf Lands Act and Outer Continental Shelf Reform Act 2010 — Oil Spills Response Act — Code of Federal Regulations	— Comprehensive Environmental Response, Compensation and Liability Act — National Environmental Policy Act — Clean Air Act — Clean Water Act — Toxic Substances Control Act
Canada	— National Energy Board — Department of Indian Affairs and Northern Development — Natural Resources Canada — Canadian Coast Guard	— Canada Oil and Gas Operations Act — Canada Oil and Gas Drilling and Production Regulations — Canada Oil and Gas Certificate of Fitness Regulations — Canada Oil and Gas Installation Regulations — Canada Oil and Gas Diving Regulations — Canada Oil and Gas Geophysical Operations Regulations — Oil and Gas Spills and Debris Liability Regulations	— Canadian Environmental Protection Act — Fisheries Act — Arctic Waters Pollution Prevention Act — Federal Sustainable Development Act — Canadian Environmental Assessment Act — Environmental Enforcement Act

[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[2] Ibid.

Table 2. Continued

Arctic country	Government agency	Regulations specific to Arctic oil and gas use	Regulations specific to Arctic environment
Russian Federation	— Ministry of Natural Resources and Environment — Federal Technical Control Service (Rostechnadzor) — Federal Nature Control Service — Agency for Subsoil Use	— Outer Continental Shelf of the Russian Federation — On Inland Sea Waters, Territorial Sea and Adjacent Zone of the Russian Federation Subsoil Use Law — On Industrial safety of Hazardous Production Facilities — Rules for Exploration and Development of Oil and Gas Fields on Continental Shelf — Water Code — Forest Code — Land Code	— Environmental Doctrine of the Russian Federation — Foundations of the State Policy of Environmental Protection of Russia for the Period until 2030 — Environmental Protection Law — Wild Animals Law — Specially Protected Natural Areas Law — On Prevention of Emergent Situations of Natural and Anthropogenic Character — Regulation on Environmental Impact Assessment
Greenland (Denmark)	— Bureau of Minerals and Petroleum — Ministry of Environment and Energy	— Mineral Resources Act — Exploration Drilling Guidelines	— Act of Protection of the Environment — Acts on Protection of Nature — Act on Compensation for Environmental Damages
Norway	— Petroleum Safety Authority	— Petroleum Activities Act — Working Environmental Act — Fire and Explosion Protection Act — Management Regulations — Information Duty Regulations — Facilities Regulations — Activities Regulations	— Pollution Control Act — Environmental Information Act — Svalbard Environmental Protection Act 2001

Presently, three Arctic states – Finland, Denmark and Sweden – are members of the EU. As such, they must comply with EU law which deals with a number of issues of direct relevance to Arctic developments.[1] For example, under Article 4 of the Treaty of Lisbon (the EU's foundational agreement), the EU shares responsibilities with member countries for fisheries, environment, transport and energy. Also very important, the Treaty gives the EU exclusive authority over other areas of key interest for the Arctic, notably the conservation of marine biological resources (Article 3 of the Treaty — Common Fisheries

[1] Czarski, M. 2015. Who governs the Arctic? OpenCanada.org. https://www.opencanada.org/features/who-governs-the-arctic (accessed 20 February 2017).

Policy).[1] The EU has a great deal of interest in the Arctic, enacting its own Arctic Policy in 2008[2] focusing on protecting and preserving the Arctic, promoting the sustainable use of its resources, and international cooperation.

§ 7. TRANSBOUNDARY PRIVATE LAW

Many particular Arctic issues are still too specific only for common general international legal regulation. Moreover, the Arctic commercial interests are increasing and transboundary private law is evolving in the framework of bilateral and multilateral treaties and cooperation.[3] The Arctic Environmental Protection Strategy (AEPS) represented first type of this more specialized regional initiative in 1991. It is a multilateral, nonbinding agreement among Arctic states on environmental protection in the Arctic. The AEPS deals with monitoring, assessment, protection, emergency preparedness/response, and conservation of the Arctic zone.[4] The AEPS described six Arctic dangerous environmental issues: persistent organic pollution, oil pollution from the shipping and oil exploration and exploitation, heavy metals, noise, radioactivity, acidification. These issues brought the idea of five Arctic principles of the protection into being: sustainable development, enjoyment of present and future generation, respect of health, social, economical and cultural needs and traditional knowledge of indigenous people, international cooperation and environmental comprises impact assessment of proposed activities. Many various environmental multilateral programs, strategies and nonbinding guidelines in the Arctic are filled in regional bilateral treaties and strategies, for example U.S. and Russian agreement and cooperation in the field of environmental protection, Canadian and Russian cooperation in the Arctic and North, agreements about migratory birds between Canada and U.S.A. from 1916 and between U.S.A. and U.S.S.R. from 1976, Mixed commission on cooperation in the Arctic and North or Canada and USA agreement on Arctic cooperation. On the other hand, there are many sensitive special topics which need to be regulated by peculiar international multilateral legal instruments like International agreement of USA, Norway, Canada, and USSR about protection of Polar Bears from 1973, protection of caribou from 1987, Polar Code of Navigation.[5]

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[1] Communication from the Commission to the European Parliament and the Council. 2008. *The European Union and the Arctic Region,* Brussels, COM (2008) 763 final.

[2] EU Arctic policy. 2008. Joint Communication on an Integrated EU Policy for the Arctic. Published by the European Commission and the High Representative on 27 April 2016. European Union External Action. https://eeas.europa.eu/arctic-policy/eu-arctic-policy_en (accessed 2 April 2017).

[3] Canuel, E. T. 2015. 'The Four Arctic Law Pillars: a Legal Framework'. *Georgetown Journal of International Law* 46: 736-764.

[4] The Arctic Environmental Protection Strategy. 1991. http://www.carc.org/pubs/v21no4/protect.htm (accessed 17 March 2017).

[5] Plášilová, D. 2011. *Current Problems of the Legal Regime of the Arctic*, Brno: Masaryk University.

CHAPTER 4
IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT AT THE DOMESTIC LEVEL

The potential impact of industrial activities in the Arctic must be considered in the context of national and global policies and legislation. To implement sustainable development in the Arctic territories is, first of all, a target of the Arctic states. Regulatory control and enforcement is strictly the responsibility of competent national authorities. International requirements are implemented by national authorities through primary legislation. This is often supported by a set of subordinate regulations and guidelines which provide more detailed information on specific requirements. Regulations in turn may be further refined by a framework of standards and consents, determining, for example, quantitative controls on emissions by prescription, by negotiated agreement, or by goal-setting. The traditional approach of prescriptive legislation is gradually being complemented by performance assessment, goal-setting, negotiated agreements and self-regulation. Consents may exert definitive controls on planning, development, and operating conditions, each of which must be met before a license or consent to proceed is granted.[1]

§ 1. STATES' COMPLIANCE WITH THE ARCTIC LAW

Ensuring compliance with international treaties and custom is one of the main issues in international law. In the Arctic, composed of sovereign states that have exclusive jurisdiction over their territory, including maritime areas and an air space, compliance with obligations that the states have accepted raises specific problems that increase when discussible matters (such as continental shelf or environmental impact) are in question.

[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

First, impacts on the Arctic territories initially arise within the limits of national jurisdiction and do not immediately and directly harm other states or the Arctic Ocean and resources, so nobody can file claims for reparations.

Secondly, violations of international hard law are most often committed by non-state actors, from individuals to large-scale industries operating in the Arctic lands and waters. Governments are responsible, because they have accepted the treaty obligations, but, in practice, compliance may be difficult, because the state must commit scarce political and economic resources to ensure the required result. In many instances, the political costs of enforcing national and international law on the private sector may be higher than when the state regulates its own activities.[1] States have various direct sanctions available to control the behavior of state agents, from disciplinary measures to dismissal. The regulation of non-state behavior, however, is likely to require legislation that may be difficult to adopt when the non-state actors play a powerful role in the domestic political arena.[2] This is a key factor in the Arctic issues, because the costs imposed on industries and the significance of their investments in the Arctic resources development has a high degree of political influence Therefore, a state may find it difficult to ensure compliance.

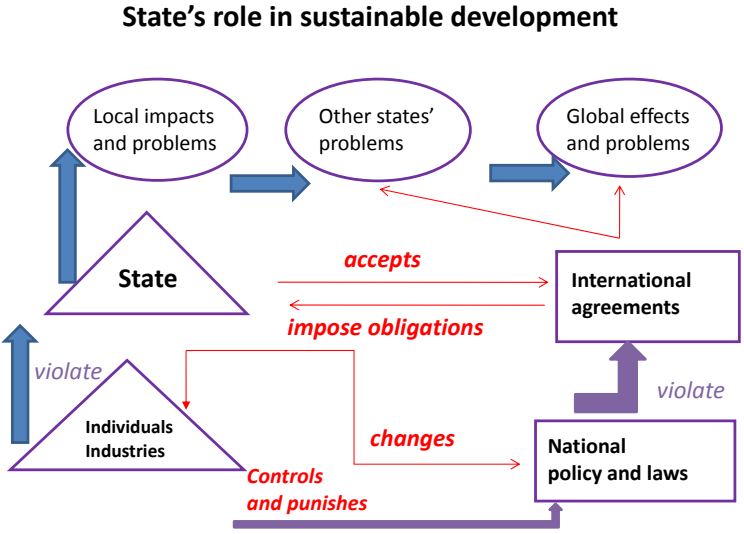

Figure 10. States and the global environment

[1] Kiss, A. and Shelton, D. 2007. *Guide to International Environmental Law*. Koninklijke Brill NV, Leiden, the Netherlands.

[2] Ibid.

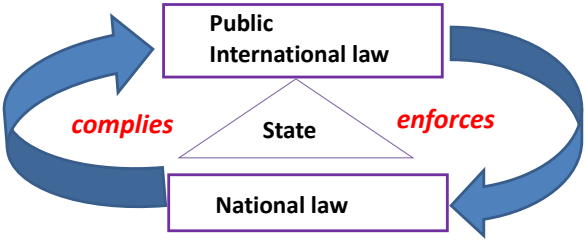

Figure 11. States and legal system

To effectively use and protect the Arctic environment and lands governments must introduce and implement legal requirements (including administrative, civil, and penal provisions) at national level. Implementation of legal requirements starts with effective compliance measures and improved administrative control and participation. These procedures should be followed by better participation, information, and judiciary control measures, culminating in effective enforcement.[1] Also there exist some specific instruments aiming at sustainable development and environmental protection (including spatial planning, landscape planning, monitoring, environmental impact assessment).

§ 2. COMPLIANCE AND ENFORCEMENT

In order to understand effective compliance and enforcement measures, it is important to define "compliance" and "enforcement" at the outset.

Compliance is the full implementation of requirements. Compliance occurs when requirements are met and desired changes are achieved, e.g., processes or raw materials are changed, work practices are changed so that, for example, hazardous waste is disposed of at approved sites, tests are performed on new products or chemicals before they are marketed, etc.[2]

Enforcement is the set of actions that governments or others take to achieve compliance within the regulated community and to correct or halt situations that endanger the environment or public health.[3] Enforcement usually includes a range of activities such as monitoring, inspecting, reporting, gathering evidence to detect violations, and negotiating with individuals and industrial operators to develop mutually acceptable methods for achieving compliance. As a last step to compel compliance, enforcement includes recourse to legal action or dispute settlement.

[1] Ercmann, S. 1996. 'Enforcement of Environmental Law in United States and European Law: Realities and Expectations'. *Environmental Law* Winter 1996: 1213.

[2] Ibid, p. 1215.

[3] Ibid, p. 1216.

The success of each enforcement program depends on how the state exercises its discretion in determining its particular needs and environmental priorities and on choosing the appropriate enforcement method. Effective compliance might require reorganizing existing administrative structures, implementing environmental legislation, using administrative instruments such as circulars, drafting legally binding instruments that are precise and comprehensive, and making short-term economic sacrifices.[1]

Typically, the factors required for the effective application of the Arctic regulations (like any other regulations) include:

- appropriate international and national laws, frameworks and guidelines;
- coherent procedures for decisions on projects/activities;
- legislation with clearly defined responsibilities and appropriate liabilities;
- enforceable standards for operations;
- appropriate monitoring procedures and protocols;
- performance reporting;
- adequately funded and motivated enforcement authorities;
- existence of adequate consultation and appeal procedures; and
- appropriate sanctions and political will for their enforcement.[2]

§ 3. MEANS OF COMPLIANCE AND ENFORCEMENT

The first step in achieving enforceable measures of sustainable development in the Arctic is to draft laws and other instruments that would provide the necessary authority for enforcement. Powers of authority may be prescribed through regulations and authorization through licenses. The legal provisions need to be stated clearly, precisely, and practically. Ultimately, this requires broad statutory, regulatory, and administrative authority, especially with respect to environmental standards.[3]

The most important means of enforcement is ***legal action***. This powerful tool is an effective method of compelling compliance and imposing consequences for violating the law. Legal action may be pursued through administrative measures, civil law application of liability rules, or by imposing criminal sanctions. The improvement of judicial control measures is important to overcome inefficient application of legislation.[4]

Civil law may be an effective enforcement measure, enabling an agency to prohibit oil and gas companies from continuing illegal activities that endanger the Arctic

[1] Ercmann, S. 1996. 'Enforcement of Environmental Law in United States and European Law: Realities and Expectations'. *Environmental Law* Winter 1996: 1217.

[2] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[3] Ercmann, S. 1996. 'Enforcement of Environmental Law in United States and European Law: Realities and Expectations'. *Environmental Law* Winter 1996: 1217.

[4] Pilcher, S. L. 1995. 'Ignorance, Discretion, and the Fairness of Notice: Confronting "Apparent Innocence" in the Criminal Law.' *American Criminal Law Review* 33 (1): 35.

environment, or to seek reimbursement of costs incurred for cleanup. In addition, strict liability may also encourage voluntary compliance.

Any instrument that is incapable of providing compliance and that cannot be enforced reduces the credibility of the instrument's goals. This applies at both the national and international levels.[1]

Other enforcement measures include:

— inspection;
— reporting;
— evidence gathering;
— record keeping;
— negotiation; and
— dispute settlement.[2]

Inspection is a primary element of most of the enforcement methods, and may be carried out regularly or randomly. Normally, it does not require a concrete suspicion, and it may be supplemented by reporting and record-keeping obligations. Inspection is a significant element of most enforcement methods used by international instruments. Gathering of information consists of recording, sampling, and analysis for the verification of compliance with established standards and technical methods. Gathering evidence at the national level is particularly important with regard to administrative and penal law infractions. With international environmental law, it takes the form of factfinding.[3]

Enforcement can also be achieved by negotiations with individuals or industries that do not comply with administrative or legislative measures. This method has so far proved to be highly successful. But while negotiations may be useful to promote compliance, there is a risk that negotiations may lead to compromised environmental values or standards.[4] For example, in the United States, Environmental Policy Act (EPA) is using more consultative procedures to develop regulations to implement the Clean Air Act.[5]

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[1] Boyle, A. E. 1991. Saving the World? Implementation and Enforcement of International Environmental Law through International Institutions'. *Journal of Environmental Law & Policy 3*: 229.

[2] *See, e.g.*: Paris Convention for the Prevention of Marine Pollution from Land-Based Sources. 1974, art. XI, *International Legal Materials* 13: 352; Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. 1989, art. X, para. 2 (b), S. Treaty Doc. No. 5, 102d Cong., 1st Sess. (1991), *International Legal Materials* 28: 649; Convention on International Trade in Endangered Species of Wild Fauna and Flora. 1973, art. VIII, paras. 6-7, 27 U.S.T. 1087, 993 U.N.T.S.; Protocol on Environmental Protection to the Antarctic Treaty. 1991, art. III, para. 2 (c)-(e), *International Legal Materials* 30: 1455; International Convention for the Prevention of Pollution from Ships. 1973, art. VI, *International Legal Materials* 12: 1319.

[3] Boyle, A. E. 1991. 'Saving the World? Implementation and Enforcement of International Environmental Law Through International Institutions'. *Journal of Environmental Law & Policy 3*: 229, pp. 236-237.

[4] Ercmann, S. 1996. Enforcement of Environmental Law in United States and European Law: Realities and Expectations, *Environmental Law* Winter 1996: 1218.

[5] Elliot, E. D. 1994. Environmental Enforcement and Economic Realities. In: Urbani, Eric J. et al. (eds.) *Transnational Environmental Law and Its Impact on Corporate Behavior*, pp. 107, 109.

Under the threats of government regulation and toxic tort litigation, companies are "voluntarily" meeting EPA's suggested goals for reducing toxic emissions. In Europe, negotiations for the privatization of state assets include agreements to clean up waste disposal sites.[1]

A new trend for implementing or enforcing national and international environmental measures is currently emerging, offering a mix of ***economic incentives*** on the one hand, and ***economic sanctions*** on the other. In Russia the amendments to the federal law "On Environmental Protection" introduce a new system of economic penalties which will be used in conjunction with standards setting and will be aimed at 'best available technologies' principle. The system will be applicable from 2020 onwards.[2]

Other enforcement tools, especially effective in the Arctic, can be area monitoring and remote sensing. New technologies permit automated and consistent monitoring of industrial emissions and discharges, thereby assisting enforcement agencies in their work.

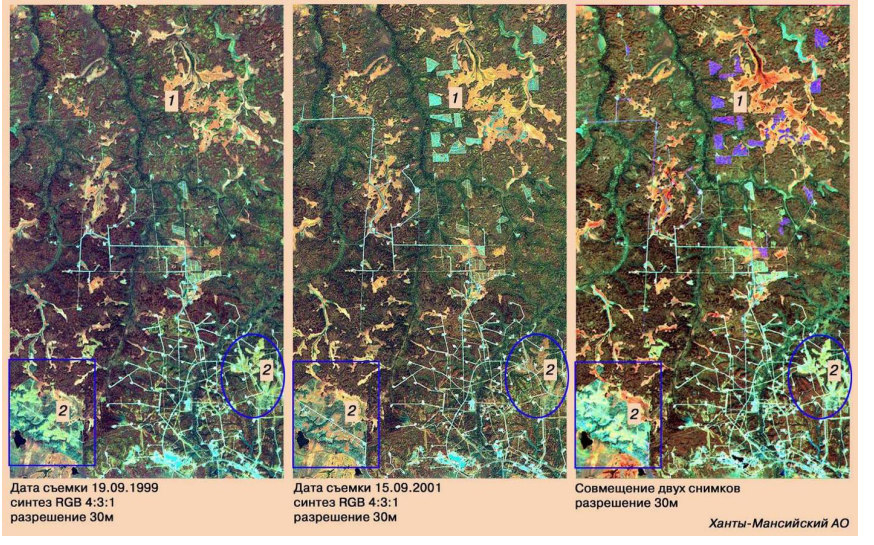

Photo 11. Monitoring of the development dynamics of oil and gas areas.
Satellite images taken by Andrey Soromotin, University of Tyumen

[1] Ercmann, S. 1996. 'Enforcement of Environmental Law in United States and European Law: Realities and Expectations'. *Environmental Law* Winter 1996: 1218.

[2] Federal Law No. 7-FZ. 2002. *On Environmental Protection* [Федеральный закон от 10 января 2002 г. № 7-ФЗ «Об охране окружающей среды» (RF)].

Monitoring

The main focus of monitoring is to confirm that commitments are being met. Monitoring can be implemented both by the governments and by industries. This may take the form of direct measurement and recording of quantitative information, such as amounts and concentrations of discharges, emissions and wastes, for measurement against corporate or statutory standards, consent limits or targets. It may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socio-economic interaction, through local liaison activities or even assessment of complaints.[1]

The preventative approach to management may also require monitoring of process inputs, for example, type and stocks of chemical use, resource consumption, equipment and plant performance, etc.

The key aims of monitoring are, first, to ensure that results/conditions are as predicted during the planning stage, and where they are not, to pinpoint the cause and implement action to remedy the situation. A second objective is to verify the evaluations made during the planning process, in particular in risk and impact assessments and standard and target setting, and to measure operational and process efficiency. Monitoring will also be required to meet compliance with statutory and corporate requirements. Finally, monitoring results provide the basis for auditing.

Monitoring objectives can also be:

— to verify effectiveness of planning decisions;
— to measure effectiveness of operational procedures;
— to confirm statutory and corporate compliance;
— to identify unexpected changes.[2]

Enforcement Authorities

Powers

In order to establish the credibility of an enforcement program, the laws should clearly specify the power and functions of the authorities responsible for enforcement. Generally, enforcement authorities are responsible for authorizations, permits, monitoring, and reporting. They might have emergency powers to enter and correct immediate dangers to the local population or environment or to take remedial actions. All these activities concern civil or administrative law. When applying administrative and eventually penal sanctions, the authorities should have powers to 1) seize property; 2) bar a facility or company from government loans, guarantees, or contracts; 3) require service or community work to benefit the environment;

[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[2] Ibid.

4) impose restrictions on financial assistance; 5) seek reimbursement for public authorities' cleanup expenses; 6) impose fines with specified amounts per unit; and 7) seek imprisonment.[1]

In Russia, the enforcement authorities engaged in the Arctic issues are the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor)[2] and the Federal Supervisory Natural Resources Management Service (Rosprirodnadzor)[3] which functions are surveillance and control over the companies operating in the Arctic, administrative penalties, suspense or withdrawal of licenses in case of violations or environmental emergency, reimbursement of cleanup expenses.

Sanctions

Administrative, civil, and even criminal sanctions may be used to enforce laws related to the Arctic. In the majority of western European countries, both penal and administrative actions can be brought forward for violations of environmental laws. Criminal actions can also be used to ensure compliance with regulatory requirements. For instance, in the United States, criminal sanctions could apply to facilities that operate without a permit, although in Europe such measures might fall more within administrative sanctions.[4]

Possible types of sanctions include 1) denial or revocation of permits, requiring an establishment to cease operations or even close (this may apply both in the administrative and penal contexts); 2) shutdown of operations (administrative or penal); 3) adverse publicity (administrative or penal); 4) economic sanctions, such as denial of government funding; 5) fines; or 6) imprisonment.[5]

Public awareness

Other methods for obtaining compliance with legal requirements include motivating the community and creating public awareness through education and incentives. The success of this approach depends on the cultural, regulatory, and economic priorities of the state. However, the experience of many countries shows that education or increased public awareness has led to successful implementation of regulations pertaining to health and the environment, even when such implementation was adverse to their economic interest.[6]

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[1] Ercmann, S. 1996. 'Enforcement of Environmental Law in United States and European Law: Realities and Expectations'. *Environmental Law* Winter 1996: 1218.

[2] Federal Environmental, Industrial and Nuclear Supervision Service. Official website. http://en.gosnadzor.ru (accessed 5 April 2017).

[3] Ministry of Natural Resources and Environment of the Russian Federation official website. http://www.mnr.gov.ru/english (accessed 5 April 2017).

[4] Ercmann, S. 1996. 'Enforcement of Environmental Law in United States and European Law: Realities and Expectations'. *Environmental Law* Winter 1996: 1219.

[5] Ibid.

[6] Ibid, p. 1220.

Oil and gas operating companies also can take action to protect the environment without state intervention. For example, in 2013 a Stakeholder Engagement Plan was developed in the Yamal LNG Project (company operating in Yamal, Arctic region of the Russian Federation) to ensure the process of continuous interaction with the public and all interested parties in the course of implementation of the liquefied natural gas project. This process is essential for the Project's successful implementation, the effectiveness of the company's business operations and reputational integrity. By undertaking activities proposed in this plan Yamal LNG demonstrates its openness, responsiveness and willingness to embark on the constructive dialogue with its stakeholders.[1] This example illustrates the importance of public awareness, education, dissemination of information, and participation in order to achieve enforcement. Furthermore, it constitutes an example of a successful personal relationship between enforcement program staff and managers to provide an incentive towards attaining compliance.

Public involvement in environmental policy and regulation has increased in recent years. Even where current legislation does not provide for this, local action has, in many cases, made public communication and consultation a de facto practice by companies. Public involvement may be through review and comment of environmental impact assessment and permit applications, negotiation for greater local benefits from operations, regular reports and consultations, or other means.[2]

§ 4. ENVIRONMENTAL IMPACT ASSESSMENT AS A SPECIFIC TOOL OF SUSTAINABLE DEVELOPMENT

The Environmental Impact Assessment (EIA) is seen as one of the most important means of implementing the goals of sustainable development.

An EIA can be defined as a ***governmentally controlled procedure by which scientific studies are made of the potential harmful environmental impacts of proposed activity***. Its goals include improving the quality of information to have decision-makers undertake better decisions from the view point of the environment and human societies and raise in general the level of participation of the public in planning the use of the environment.[3]

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[1] Yamal LNG. 2013. Stakeholder Engagement Plan, Issue 5. ENVIRON. http://yamallng.ru/403/docs/stakeholder_engagement_plan.pdf (accessed 30 March 2017).

[2] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[3] Koivurova, T. et al. 2016. *Environmental Impact Assessment in the Arctic: A Guide to Best Practice*. Edward Elgar Publishing, p. 2.

Environmental impact assessment can also be defined as ***assessment of the possible positive or negative impact that a proposed project may have on the environment, together consisting of the natural, social and economic aspects***.[1]

EIA became a method for decision makers to avoid the irreversible decisions of the past – or at a minimum – make better-informed decisions in the future. Although recommendations emerging from an EIA did not bind the decision-maker, the overall effect of completing an EIA induced more "environmentally-benign" decisions.[2] It is a process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made.[3]

The birthplace of EIA is regarded to be in the United States with the passage of the National Environmental Policy Act (NEPA).[4] In the U.S., as well as other industrialized countries, there was an increasing awareness of environmental degradation, stimulating pubic interest activism at the local, regional, and national levels. Aided by a fuller comprehension of environmental problems due to the proliferation of scientific and technical data, environmental public interest groups were more vocal. The environmental consequences from poorly planned development galvanized public pressure for greater intervention in the development process. NEPA called for an interdisciplinary approach to planning and the development of procedures to give environmental factors appropriate consideration in decision making.[5]

Possibly the first indirect recognition of EIA at the international level was contained in the World Charter for Nature, which outlined principles of conservation to guide human conduct.[6] The Charter is a non-binding instrument. The common elements in EIA domestic legislation are mirrored in the Charter. It calls for an exhaustive examination and assessment of activities likely to pose a significant risk to nature and requires that activities should either not proceed or proceed with minimal potential adverse effects based on an assessment's findings. If an activity is likely to cause irreversible damage to nature, it is to be avoided. Where activities are likely to pose a significant risk to nature, it should be preceded by an exhaustive examination where the proponents demonstrate that expected benefits outweigh potential damage to

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[1] CTI Reviews. 2016. *Environmental and Economic Sustainability: Economics, Environmental Economics.* Cram101 Textbook Reviews.

[2] Sheate, W. 1996. *Environmental Impact Assessment: Law & Policy Making an Impact.* Cameron May Limited.

[3] Gray, K. R. 2000. 'International Environmental Impact Assessment: Potential for a Multilateral Environmental Agreement'. *Colorado Journal of International Environmental Law* 11: 83.

[4] National Environmental Policy Act of 1969 § 101, 1994. 42 U.S.C. § 4331.

[5] Gray, K. R. 2000. 'International Environmental Impact Assessment: Potential for a Multilateral Environmental Agreement'. *Colorado Journal of International Environmental Law* 11: 83.

[6] World Charter for Nature. 1982. G. A. Res. 37/7, U.N. GAOR, 37th Sess., Agenda Item 21, U.N. Doc. A/RES/37/7. *International Legal Materials* 23: 455.

nature. If the adverse effects are not fully understood, the activities should not proceed. Any assessments are to be disclosed to the public to allow for effective consultation and participation, and all persons, in accord with their national legislation, are to be afforded an opportunity to participate in the formulation of decisions of direct concern to their environment.[1]

Since the Charter, the use of EIA has been expressed in various non- binding (soft law) documents. Agenda 21 calls for the assessment of impacts upon the environment and the monitoring of those effects and changes.[2] The signatory states are required to ensure that relevant decisions are preceded by environmental impact assessments and to take into account the costs of any ecological consequences.[3] Principle 17 of the Rio Declaration states that "Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority".[4]

It did not take long for other countries to adopt their own EIA requirements. Over 70 % of the world's nations adopted either informal or mandatory EIA requirements. Although numerous EIA regimes mirror each other in many ways, they are still tailored to match the jurisdiction's geophysical characteristics, environmental needs, level of socioeconomic development, and cultural and governmental traditions.[5] However, certain basic element of EIA can be outlined.

EIA is a legal procedure, and the developers or governments are obligate to organize it. A typical EIA is established either via a separate piece of legislation or by including EIA provisions in existing sectoral laws. The main function of EIA is to produce scientific information for the decision-making on the proposed activity. In this sense, EIA is not a procedure leading to the decision but it produces information for a separate procedure which deals with the actual decision, for example licensing.

The EIA should be multidisciplinary, flexible, cumulative, precautionary and allow to involve a widerange ofstakeholders.

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[1] Gray, K. R. 2000. 'International Environmental Impact Assessment: Potential for a Multilateral Environmental Agreement'. *Colorado Journal of International Environmental Law* 11: 83.

[2] United Nations Conference on Environment and Development. 1993. Agenda 21: *Programme of Action for Sustainable Development*, chs. 35, 40.

[3] Gray, K. R. 2000. 'International Environmental Impact Assessment: Potential for a Multilateral Environmental Agreement'. *Colorado Journal of International Environmental Law* 11: 83.

[4] Rio Declaration on Environment and Development, United Nations Conference on Environment and Development, U.N. 1992. Doc. A/CONF.151/5/Rev.1. *International Legal Materials* 31: 874.

[5] Sadler, B. 1996. *Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance.* Canadian Environmental Assessment Agency, pp. 25-31.

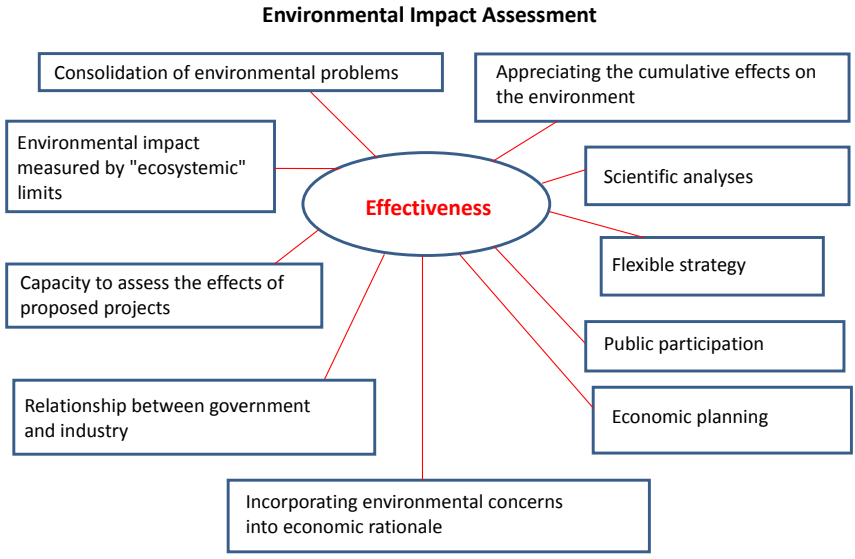

Figure 12. Factors of EIA effectiveness

Stages of EIA are also typical for most countries. The main steps in the EIAs are:

- the application of an EIA;
- scope of the assessment;
- baseline information;
- impact prediction and evaluation;
- mitigation;
- monitoring;
- the environmental impact assessment document;
- public participation; and
- transboundary impacts (in case of transboundary environmental impact).

Almost all states of the world nowadays have EIAs in place, and so do the eight Arctic states.[1] As the Arctic is the most vulnerable territory in the process of industrial development, this modernized tool can provide for effective sustainable development and prevent from irreversible impacts. Given the enormous pace of change in the Arctic, EIA is at the forefront of making this increasing industrial and economic development in

[1] Sadler, B. 1996. *Environmental Assessment in a Changing World: Evaluating Practice to Improve Performance.* Canadian Environmental Assessment Agency, pp. 25-31.

the region sustainable, both its vulnerable ecosystems and indigenous and other local communities.[1]

The objectives of an Arctic EIA are:

— to estimate and describe the nature and likelihood of environmentally damaging events to provide a basis for decision-making;
— to provide for the incorporation of traditional knowledge and consultations with the developer;
— to devise and implement remedial measures for eliminating or minimizing undesirable impacts.[2]

Table 3

Tasks in an Arctic EIA process

Application of EIA	The decision to conduct an EIA for a project should take into account the special conditions in the Arctic; arctic-specific thresholds and sensitivity criteria are strongly recommended
Scope of the assessment	The scope of an assessment should include all potential environmental, socio-cultural and economic impacts, especially impacts on the traditional uses of resources and livelihoods of indigenous people and also the consideration of alternatives
Baseline information	The following key issues should be considered: combining traditional and scientific knowledge, using methods compatible to existing data collection programs in the Arctic, including socio-economic matters, using both qualitative and quantitative information and allowing sufficient time for collecting and compiling baseline information
Impact prediction and evaluation	Issues identified through scoping are analyzed and expected impacts defined by identifying the type of impacts, by predicting the magnitude, the probability of occurrence and the extent of the impacts and by determining the significance of the impacts. In the Arctic, cumulative impacts are of special concern
Mitigation	Mitigation aims at avoiding or lessening impacts. In considering mitigation measures, special arctic features should be taken into account and the public should also be involved
Monitoring	Monitoring should include follow up of impacts, verification of predictions and feedback on mitigation and project operations. The environmental conditions in the Arctic make monitoring a demanding task requiring careful planning

[1] Koivurova, T. et al. 2016. *Environmental Impact Assessment in the Arctic: A Guide to Best Practice.* Edward Elgar Publishing, p. 5.

[2] Guidelines for Environmental Impact Assessment (EIA) in the Arctic. 1997. Arctic Environmental Protection Strategy. http://www.vyh.fi/fei/intercoo/arctic/index.htm (accessed 30 March 2017).

Table 3. Continued

The environmental impact assessment document	An environmental impact assessment document should be prepared and provided to all involved parties. The document describes the project and its likely impacts upon the environment
Public participation	An EIA should ensure effective public participation and consultation. Unique features such as the culture, the socioeconomic situation and the remoteness of the Arctic should be considered in planning and carrying out public consultations in the Arctic
Traditional knowledge	In the EIA process, traditional knowledge should be used in the understanding of possible consequences of predicted impacts and in reducing uncertainties
Transboundary impacts	Assessments of transboundary impacts require project developers and authorities to make allowances for different legal systems, to provide translations when necessary, and to make special arrangements for public participation across jurisdictional borders

Environmental Impact Assessment forms an important tool, particularly in the context of land-use planning. The approval process may consist of several stages with land use, siting and planning approvals being granted, following the acceptance of the EIA. Further permits may be required under specific legislation such as fire, safety and emergency procedures, waste disposal, construction methods, engineering codes etc. Such approvals need to be obtained before operations begin, and this, given the different administrative jurisdictions, is frequently a complex process. In a small but increasing number of countries, permits are being combined into a single approval, but this is not yet widespread.[1] While cumulative impacts are recognized during the assessment of projects, many cumulative impacts on the Arctic environment cannot be dealt with effectively at the individual project level. Land use and resource use plans or area plans are often developed for particular regions. These plans can be used to guide the future direction of a sector, for example, the forest sector or reindeer husbandry, by taking into account sustainability criteria. The assessment of these plans, often called strategic environmental assessment, includes similar tasks to those used during the environmental impact assessment of individual projects. At the same time, these plans can be a basis for the assessment of individual projects and specify conditions a project has to meet to avoid significant adverse impacts.[2]

[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[2] Guidelines for Environmental Impact Assessment (EIA) in the Arctic. 1997. Arctic Environmental Protection Strategy. http://www.vyh.fi/fei/intercoo/arctic/index.htm (accessed 30 March 2017).

The environmental impact assessment (EIA) in Russia is based on the requirements of the Constitution of the Russian Federation, according to Article 42 of which 'everyone has a right to a favourable environment, as well as reliable information about it'. According to Article 3 of the Federal Law "On Environmental Protection", the assessment of environmental impacts is obligatory for all projects that 'have a direct or indirect impact on the environment'. The Federal Law 'On Ecological Expertise' formulates the requirement for an ecological expertise regarding the EIA materials. The 'Regulation of Environmental Impact Assessment' describes step-by-step the general procedure of the EIA in the Russian Federation, as well as requirements for the EIA materials. The documents applicable to EIA's procedure in the Arctic, though there is no specially designed document to regulate EIA in the Russian Arctic.

The EIA in Russia is presented by two separate procedures – the State Environmental Review (SER), that is verifying the project compliance with environmental laws and environmental impact assessment (EIA) in its common sense In some cases, EIA precedes the SER. The decisions are made on the SER stage and very often these decisions do not implicate deep studies of possible environmental impacts. It results in a formal decision by competent authorities stating whether the activity may start. Besides reviews performed by competent authorities, independent environmental reviews can be carried out by non-governmental actors at their expense. SER and EIA are mandatory for planned economic and other activity that can have a direct or indirect impact on the environment. The list of facilities subject to mandatory EIA includes all large-scale energy, industry, and agricultural facilities. Within the framework of EIA, potential negative impacts and concerns of the general public are studied and measures to prevent and reduce adverse project impacts are developed. Although the need for a differentiated approach is recognized, there are no screening criteria for the sites subject to environmental assessment. Strategic Environmental Assessment (SEA) remains largely outside the scope of current procedures. The EIA/SER system is quite technocratic and implies little public involvement. Incentives to carry out environmental assessments at the early stages of project preparation hardly exist due to poor development of procedures and oversight mechanisms, In many cases, the public does not get any information or the opportunity to "participate" until very late stages of the process. The responsibilities of the project developer and the public authority to ensure public awareness and public participation are not defined clearly enough and create conditions for their arbitrary interpretation and, eventually, grounds conducive to conflicts. When public participation does take place, it is rather driven by NGO activism than the policy of involving the public in environmentally relevant decisions or prevention of investment risks.[1]

Box 6. EIA process in Russia

[1] Environmental Policy and Regulation in Russia: the Implementation Challenge. 2006. OECD Publishing.

CHAPTER 5
SPATIAL PLANNING AS A WAY TO SUSTAINABLE DEVELOPMENT

Land use changes which are taking place in the Arctic may bring positive economic and negative environmental impacts. Today, the Arctic faces conflicts between various human activities that influence one another and compete for territories and lands.[1] For that reason, in most countries, in the Arctic countries as well, the quest for solutions based on new concepts and reliable data and focused on the provision of sustainable use of lands is viewed as a crucial mission of state policy and management.

In domestic and international practices there are a number of instruments which provide for effective land resources distribution and use and contribute to sustainable development.

§ 1. DEFINITION OF LAND-USE PLANNING

Land-use planning is an essential tool which can be effectively used for allocation of lands, choosing land-use models, pollution prevention and control. Land use refers to the different socioeconomic activities occurring in a particular area, the human behavior patterns and their effects on the Arctic environment. While this activity takes place at the local and regional levels, they can also contribute to global processes, such as climate change, loss of biodiversity, etc. Therefore, by appropriately defining land use, establishing where and how it occurs, as well as effectively controlling its performance and interrelation, stakeholders (governments, oil and gas companies, traditional land users) can actively participate in preventing and controlling negative impacts and contribute to positive changes.

[1] Fact Sheet. Increasing Land-Use Pressures in the European Arctic. Strategic Assessment of Development of the Arctic: Assessment Conducted for the EU. http://www.arcticinfo.eu/images/Facksheet/Factsheets_Final/land_pressures.pdf (accessed 30 March 2017).

Land-use planning refers to the ***process by which a society, through its institutions, decides where, within its territory, different socioeconomic activities such as agriculture, housing, industry, recreation, and commerce should take place***. This can also include protecting well-defined areas from development due to environmental, cultural, historical, or similar reasons, and establishing provisions that control the nature of development activities.[1]

Land-use planning is the term used for a branch of public policy encompassing various disciplines which seek to order and regulate land use in an efficient and ethical way, thus preventing land-use conflicts. Governments use land-use planning to manage the development of land within their jurisdictions. In doing so, the governmental unit can plan for the needs of the community while safeguarding natural resources.[2] Often one element of a comprehensive plan, a land-use plan provides a vision for the future possibilities of development in neighborhoods, districts, cities, or any defined planning area.

Land-use planning can be defined as ***the systematic assessment of land potential, alternatives for land use and economic and social conditions in order to select and adopt the best land-use options***.[3] Its purpose is to select and put into practice those land uses that will best meet the needs of the people while safeguarding resources for the future. The driving force in planning is the need for change, the need for improved management or the need for a different pattern of land use dictated by changing circumstances.[4]

One ***objective of land-use planning*** and land development is sustainable development of territories, ensuring safety and favorable living conditions, prevention of negative impact from any activity upon environment, protection and rational use of natural resources for existing and future generations.

Functions of land-use planning are:

- rational use of natural resources;
- support of human activity by the systems of engineering, transportation and social infrastructures;
- rational communication between areas with different land uses;
- observance of restrictions established due to specific conditions (sanitary, preservation of natural and cultural objects, others);
- ensuring of safety and acceptable environmental qualities.

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[1] Samper, A. Land Use Planning. Guidance Notes on Tools for Pollution Management. http://siteresources.worldbank.org/INTRANETENVIRONMENT/Resources/244351-1279901011064/GovLandUsePlanning.pdf (accessed 30 March 2017).

[2] *For more information see:* Young, A. 1998. *Land Resources: Now and for the Future*, Cambridge University Press.

[3] Ibid, p. 84.

[4] Guidelines for Land-Use Planning. 1993. Food and Agriculture Organization of the United Nations. FAO Corporate Document Reporitory. http://www.fao.org/docrep/T0715E/t0715e02.htm#what is land use planning (accessed 30 March 2017).

Table 4

Land use pressures, drivers and impacts in the Arctic[1]

Land use issue	Main drivers	Environmental impacts	Social impacts	Economic impacts
Hydrocarbon explotitation: A major land-use activity in the Arctic	Demand for resources and energy. Economic development priority in Russia	Decreased biodiversity, habitat destruction and fragmentation. Changes in landscape, water and ecosystem. Potential pollution. Changes of the routes of migratory animals. Reduced nature values	Less reindeer pasture and potential effects on reindeer herding culture. Fewer ecotourism areas. Demographic change: influx of foreign workers; shifts in social structure in rural communities. Job opportunities, skills transfer, increased services	More employment opportunities. Increased tax revenues. Local employment and increased spending. Investments by government and private sector. Decreased tourism
Transport: development of transport and community infrastructure	Demand for new transport infrastructure for hydrocarbon projects, industrial development, tourism and other activities	Biodiversity losses and habitat fragmentation. Increased noise. Increased accessibility to remote places. Reduced nature values	Supports new settlements and migration which affects needs for schools, housing, jobs, social life and well-being	Economic stimulation. Public costs of infrastructure. More employment opportunities. Increased tax revenues
Tourism: Expansion of tourism: more people, more places, more infrastructure	Demand particularly for winter and ecotourism. Local economies may be dependent on tourism	Increased noise, land erosion, wastes, pollution. Disturbance of reindeer and wildlife	Demographic change: seasonal workers; shifts in social structure in rural communities. Job opportunities, increased services. Potential social problems	Local employment. Increased spending for public services. Investments by government and private sector. Increased tax revenues

[1] Fact Sheet. Increasing Land-Use Pressures in the European Arctic. Strategic Assessment of Development of the Arctic: Assessment Conducted for the EU. http://www.arcticinfo.eu/images/Facksheet/Factsheets_Final/land_pressures.pdf (accessed 30 March 2017).

Table 4. Continued

Land use issue	Main drivers	Environmental impacts	Social impacts	Economic impacts
Nature Conservation: Expansion of protected areas. Species protection	Increased environmental awareness and NGO actions. Local, national and international policies and agreements	Sustain biodiversity and habitats. Increase populations of big predators	Human well-being via ecosystem services and nature-based tourism	Loss of reindeer from predators (when, e.g., wolf populations increase). Less area available for forestry. Increase in ecosystem services
Reindeer Herding: Traditional Way of Life and Activities	Sustaining culture and traditional way of life in herding, fishing, gathering and agriculture	Changes in grazing, habitat and fragmentation. Increased land erosion	Traditional livelihoods support local, cultural and ethnic identity and keep remote communities alive. Threat of loss of traditional lifestyles affecting cultural identity and peoples' well-being	Household dependence on traditional way of life. Subsistence costs of reindeer losses to predatory animals

§ 2. LAND-USE PLANNING AT DIFFERENT LEVELS IN THE STATE

National level

At the national level, planning is concerned with national goals and the allocation of resources. In many cases, national land-use planning does not involve the actual allocation of land for different uses, but the establishment of priorities for district-level projects. A national land-use plan may cover:

- ***land-use policy***: balancing the competing demands for land among different sectors of the economy food production, hydrocarbon development, tourism, wildlife conservation, housing and public amenities, roads, industry;
- ***national development plans and budget***: project identification and the allocation of resources for development;
- ***coordination of sectoral agencies*** involved in land use;
- ***legislation*** on such subjects as land tenure, forest clearance and water rights.[1]

National goals are complex while policy decisions, legislation and fiscal measures affect many people and wide areas. Decision-makers cannot possibly be specialists in all

[1] Land Resources. 1993. *Food and Agriculture Organization of the United Nations. Soil Resources, Management, and Conservation.* Food & Agriculture Org.

facets of land use, so the planners' responsibility is to present the relevant information in terms that the decision-makers can both comprehend and act on.

District (regional) level

District level refers not necessarily to administrative districts but also to land areas that fall between national and local levels. Development projects are often at this level, where planning first comes to grips with the diversity of the land and its suitability to meet project goals. When planning is initiated nationally, national priorities have to be translated into regional plans. Conflicts between national and regional interests will have to be resolved. The kinds of issues tackled at this stage include:

— the spatial allocation of developments such as new settlements, mineral deposits, forest plantations and irrigation schemes;
— the need for improved infrastructure such as water supply, roads and marketing facilities;
— the development of management guidelines for improved kinds of land use on each type of land.[1]

Regional Project: Bovanenkovo's gas pipeline – Ukhta. Third thread

"Bovanenkovo's gas pipeline – Ukhta. The third thread" is the gas pipeline component "Yamal – Europe". The projects will become part of Uniform system of gas supply. Construction of the III thread is going to perform in one corridor with the gas pipelines constructed according to "the System of the Main Gas Pipelines of Bovanenkovo project – Ukhta" (first and second thread). Construction of the gas pipeline is planned to start between January, 2017 and January, 2019. Complete construction of the gas pipeline and start of operation is planned for the period December, 2021 to December, 2023. The Project service life of the gas pipeline is estimated to be 50 years.

The main sources of gas are the Bovanenkovo oil and gas field and the Harasaveysky gas-condensate field located on the Yamal Peninsula, and also gas fields of the North of Western Siberia.

The system of the main gas pipelines of "Bovanenkovo – Ukhta" will be built for transportation of gas from fields to the northern and central regions of Russia (The Komi Republic, the Arkhangelsk, Vologda, Leningrad, Kostroma, Novgorod, Tver, Pskov and Smolensk areas) and further to the European consumers. The project annual average volume of transportation through "Bovanenkovo's gas pipeline – Ukhta. The third thread" makes 60 billion cubic meters. The total length of the third gas pipeline of "Bovanenkovo – Ukhta" will be 1 110 km of which 302 km will pass across the territory of the Yamalo-Nenets Autonomous District, and 808 km across the territory of the Komi Republic. The gas pipeline will be constructed both above and under ground. River crossings will be realised as tunnels below the river bed.

Box 7. Example of a regional project description

[1] Land Resources. 1993. *Food and Agriculture Organization of the United Nations. Soil Resources, Management, and Conservation.* Food & Agriculture Org., p. 7.

Local level

The local planning unit may be an urban or rural settlement, village or a group of settlements or a small water catchment. At this level, it is easiest to fit the plan to the people, making use of local people's knowledge and contributions. Where planning is initiated at the district level, the program of work to implement changes in land use or management has to be carried out locally. Alternatively, this may be the first level of planning, with its priorities drawn up by the local people. Local-level planning is about getting things done on particular areas of land – what shall be done where and when, and who will be responsible.[1]

§ 3. PEOPLE IN LAND-USE PLANNING

Land-use planning involves getting many different people to work together towards common goals. Three groups of people are directly involved:

1. Land users

These are the people living in the planning area whose livelihood depends wholly or partly on the land. They include not only farmers, herders, foresters and others who use the land directly but also those who depend on these people's products. The involvement of all land users in planning is essential. Ultimately, they have to put the plan into effect and must therefore believe in its potential benefits as well as in the fairness of the planning process.

The experience and determination of local people in dealing with their environment are often the most neglected. People will grasp development opportunities that they themselves have helped to plan more readily than any that are imposed on them. Without the support of local leaders, a plan is not likely to succeed.

Achieving effective public participation in planning is a challenge. Planners have to invest the time and resources needed to secure participation through local discussions, by broadcasting and newspaper articles, through technical workshops and extension services.[2] Forms of public participation differ in various countries. In the Soviet Union, for example, tools of public participation in land-use planning were totally different from those used in democratic states and sometimes public participation was totally absent. The Russian Federation, in the period of democratic reforms, has borrowed the experience of active civil engagement and public participation from developed democratic countries. Most forms of citizen participation in Russia appeared not so long ago and even now citizens are hardly involved in public governance concerning land use. This happens only when federal laws set obligatory requirements (public hearings on the budget, municipal charter, city planning issues) or when there is a need to legitimize

[1] Land Resources. 1993. *Food and Agriculture Organization of the United Nations. Soil Resources, Management, and Conservation.* Food & Agriculture Org.

[2] Ibid, pp. 9-10.

decisions on disputes between the municipality and commercial companies (citizens surveys and public hearings on issues related to the construction of objects).

2. Decision-makers

Decision-makers are those responsible for putting plans into effect. At national and district or regional levels, they are government ministers or specialized agencies; at the local level, they are municipal authorities.

The planning team provides information and expert advice. The decision-makers guide the planning team on key issues and goals while also deciding whether to implement plans and, if so, which of the options presented should be chosen. Although the leader of the planning team is in charge of day-to-day planning activities, the decision-maker should be involved at regular intervals.

Decision-makers also have a key role in encouraging public participation through their willingness to expose their decisions and the way they are reached to public scrutiny.[1]

3. The planning team

An essential feature of land-use planning is the treatment of land and land use as a whole. This involves crossing boundaries between disciplines (natural resource, engineering, agricultural and social sciences), so teamwork is essential. Ideally, a team needs a wide range of specific expertise; for example a soil surveyor, a land evaluation specialist, an agronomist, a forester, a range and livestock specialist, an engineer, an economist and a sociologist.

Such a range may only be available at the national level. At the local level, a more typical planning team may consist of a land-use planner and one or two assistants. Each must tackle a wide range of jobs and will consequently need specialist advice. Government agency staff and universities may be useful sources of assistance.[2]

§ 4. CONCEPT AND EXPANSION OF SPATIAL PLANNING

Spatial planning refers to the methods used by the public sector to influence the distribution of people and activities in spaces of various scales.[3]

Spatial planning is a new, more comprehensive, tool of land-use planning. It is recognized that spatial planning is a much wider concept which focuses on resource allocation and investment in a planned framework (not just land-use). Land-use planning can be integrated with economy and policy in the spatial planning structure. Spatial planning puts more attention on spatial pattern/distribution of land resources and users.[4]

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[1] Land Resources. 1993. *Food and Agriculture Organization of the United Nations. Soil Resources, Management, and Conservation.* Food & Agriculture Org., pp. 9-10.

[2] Ibid, p. 10.

[3] Spatial Planning: What Is This? Spatial Planning Seminar: Technology Enhanced Blended Learning. http://www.ess.co.at/SPATIALPLANNING/planning.html (accessed 30 March 2017).

[4] Chen, W., Carsjens, G. J., Zhao, L. and Li, H. 'A Spatial Optimization Model for Sustainable Land Use at Regional Level in China: A Case Study for Poyang Lake Region'. Sustainability. http://www.mdpi.com/journal/sustainability (accessed 10 May 2017).

There are numerous definitions of spatial planning. One of the earliest definitions comes from the European Regional/Spatial Planning Charter, adopted in 1983 by the European Conference of Ministers responsible for Regional Planning: ***Spatial planning gives geographical expression to the economic, social, cultural and ecological policies of society. It is at the same time a scientific discipline, an administrative technique and a policy developed as an interdisciplinary and comprehensive approach directed towards a balanced regional development and the physical organization of space according to an overall strategy***.[1]

Numerous planning systems exist around the world. Especially in Northwestern Europe spatial planning has evolved greatly since the late 1950s.[2] Spatial planning in different countries is implemented in different ways, it is largely determined by the characteristics of political systems, by environmental problems facing the countries in question, and by planning traditions. Ecological requirements on spatial planning exist in the form of holistic integral concepts, but by no means do they exist in all countries, nor at all administrative levels.[3] The core document for spatial planning in Europe is the European Regional/Spatial Planning Charter. It was adopted in 1983 and was incorporated into Recommendation (84) 2 of the Committee of Ministers to Members States on the European Regional/Spatial Planning Charter.[4] The Charter defines the major Europe-wide objectives that should underlie policies for spatial planning, improvement of the quality of life, and the organization of human activities in the physical space of Europe.

The following trends in spatial planning can be identified:

— comprehensive, "thorough" planning systems are gaining acceptance;
— the planning systems are responsive to the ever increasing impact of market factors;
— the planning procedures are becoming more flexible;
— in some countries (Spain, Belgium), decentralisation of the planning process is taking place;
— there is an increase in general awareness for the significance of urbanized areas for sustainable development; and
— the role played by the state as the highest instance in decision-making is still of fundamental significance.[5]

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[1] Reimer, M. 2014. *Spatial Planning Systems and Practices in Europe: A Comparative Perspective on Continuity and Changes.* Routledge, p. 40.

[2] Van Assche, K. and Verschraegen, G. 2008. 'The limits of planning: Niklas Luhmann's systems theory and the analysis of planning and planning ambitions'. *Planning Theory* 7 (3): 263-283.

[3] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers.

[4] European Regional/Spatial Planning Charter. Council of Europe official website. http://www.coe.int/t/dgap/localdemocracy/cemat/VersionCharte/Default_en.asp (accessed 30 March 2017).

[5] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers, p. 19.

Public participation and involvement are keystones of spatial development. The support, involvement and will of the public are vital to conserving, managing or developing territories on a sustainable basis. The European Regional/Spatial Planning Charter drew attention to the need for active public participation in the spatial planning process.[1] Also Recommendation of the Committee of Ministers to the Member States on the "Guiding Principles for Sustainable Spatial Development of the European Continent"[2] reiterated the importance of the effective participation of society in the spatial development process. Societal consensus is very important for the success of local and regional initiatives and also creates a dynamic environment for outside investors and economic players. The involvement of the younger generation in the planning process increases the chances of interesting the public in the long-term planning of their home region and in efficient and innovative participation.[3]

§ 5. LANDSCAPE APPROACH IN SPATIAL PLANNING

The main task of spatial planning is the management of a sustainable regional development. For this, the social and economic demands on the landscape must be brought in line with its ecological functions in order to achieve a sustainable balanced manner. The landscape approach is rather new and very effective tool for planning the use of lands in many countries.

> The landscape has an important public interest role in the cultural, ecological, environmental and social fields, and constitutes a resource favourable to economic activity whose protection, management and planning can contribute to job creation; contributes to the formation of local cultures and... is a basic component of the natural and cultural heritage, contributing to human well-being. Landscape is considered to become an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognized as being of outstanding beauty as well as everyday areas. It is a key element of individual and social well-being and... its protection, management and planning entail rights and responsibilities for everyone ***(Preamble to the European Landscape Convention)***.

Box 8. What is a landscape?

[1] European Regional/Spatial Planning Charter. Council of Europe official website. http://www.coe.int/t/dgap/localdemocracy/cemat/VersionCharte/Default_en.asp (accessed 30 March 2017).

[2] Guiding Principles for Sustainable Spatial Development of the European Continent. Council of Europe official website. http://www.coe.int/t/dgap/localdemocracy/cemat/VersionPrincipes/Default_en.asp (accessed 30 March 2017).

[3] Mariotti, E. 2010. *Guilding Principles of European and Italian Law for Spatial Development and for Territorial Governance.* Maggioli Editore, p. 361.

Landscape may be characterized as ***an area perceived by people, whose character is the result of the action and interaction of natural and/or human factors***.[1]

Taking into consideration an emerging role of landscape, landscape planning has become one of the tools used in spatial planning. By landscape planning it's attempted to influence the spatial organization of landscapes. This is achieved by making trade-offs between different needs, demands, values and land uses. Landscape planning deals with the difficult question of how to solve land-use conflicts between different interest groups and proposes strategies for future development and organization of a landscape.[2] The European Landscape Convention describes landscape planning as a strong forward-looking action to enhance, restore or create landscapes.[3] Landscape planning focuses on protection of landscapes which means action to conserve and maintain the significant or characteristic features of a landscape, justified by its heritage value derived from its natural configuration and/or from human activity. In the process of landscape planning the interested actors take strong forward-looking action to enhance, restore or create landscapes.[4]

Alongside with landscape planning terms there is a tendency to identify landscape policy and landscape management of the state.

"Landscape policy" means an ***expression by the competent public authorities of general principles, strategies and guidelines that permit the taking of specific measures aimed at the protection, management and planning of landscapes***.[5] Landscape management means ***action, from a perspective of sustainable development, to ensure the regular upkeep of a landscape, so as to guide and harmonize changes which are brought about by social, economic and environmental processes***.[6]

The basic international document regulating landscape planning is **European Landscape Convention**.[7] This treaty, also known as the Florence Convention, is the first international agreement to be exclusively devoted to all aspects of European landscape. The Convention of the Council of Europe promotes the protection, management and planning of European landscapes and organizes European co-operation on landscape issues. It applies to the entire territory of the European states and covers natural, rural, urban and peri-urban areas. It concerns landscapes that might be considered outstanding as

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[1] European Landscape Convention. 2000. Council of Europe official website. http://www.coe.int/en/web/landscape (accessed 30 March 2017).

[2] Tress, B. 2006. *From Landscape Research to Landscape Planning: Aspects of Integration, Education and Application.* Springer Science & Business Media, p. 2.

[3] Tress, G., Tress, B. et al. 2006. Trends in Landscape Research and Landscape Planning: Implications for PhD Students. http://edepot.wur.nl/38273 (accessed 30 March 2017).

[4] Déjeant-Pons, M. 2006. 'The European Landscape Convention'. *Landscape Research* 31 (4).

[5] Nolon, J. R. 2006. *Compendium of Land Use Laws for Sustainable Development.* Cambridge University Press, p. 11.

[6] Ibid.

[7] European Landscape Convention. 2000. Council of Europe official website. http://www.coe.int/en/web/landscape (accessed 30 March 2017).

well as 'average' or degraded landscapes. The Convention is aimed at: the protection, management and planning of all landscapes and raising awareness of the value of a living landscape.[1]

The practice of landscape planning varies greatly in European countries. Landscape planning in Germany, for example, is a well-established and effective instrument and is applied nationwide. It has a long tradition in Germany and is a well-established central planning instrument for prevention oriented nature conservation.[2] Its roots go back to the early 19th century, when the dominant concepts were the "land improvement" and "land beautification".[3]

Photo 12. Harp settlement, Yamalo-Nenets Autonomous District.
Taken by Tatiana Koroleva

Since landscape planning in most states is not directly legally binding, its implementation depends on other planners, policy-makers, and the public. It is therefore necessary to develop landscape planning tools which will permit the channeling of directives into the mainstream of relations regulated by property law or common law.[4]

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[1] European Landscape Convention. Details of Treaty No. 176 Council of Europe official website. http://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/176 (accessed 30 March 2017).

[2] Von Haaren, C., Galler, C. and Ott, S. 2008. *Landscape Planning: The basis of sustainable landscape development.* BFN Federal Agency for Nature Conservation.

[3] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers, p. 21.

[4] Ibid, p. 33.

§ 6. SYSTEM OF LANDSCAPE PLANNING

Landscape planning is not to be understood as mere "Nature Conservation Planning", but as an integral and interdisciplinary approach. It is therefore in principle applied area-wide to inhabited and uninhabited areas. Landscape planning has a coordinating task. During the planning process, extensive surveys of the landscape functions (e.g., yield function, natural resources, climate regulation, biodiversity, recreational value) and the requirements of the human population in these functions are captured to identify the existing potentials and conflicts. On this basis, different scenarios of landscape development can be considered to develop an objective approach for the planning area. Finally, space-bound and general measures to implement a target concept are developed and comprehensively presented. Sectoral plans and policies may include problems related to environmental pollution, nature conservation, urban sprawl, rural development, health issues, tourism, recreation, cultural heritage, hazard research and others.[1]

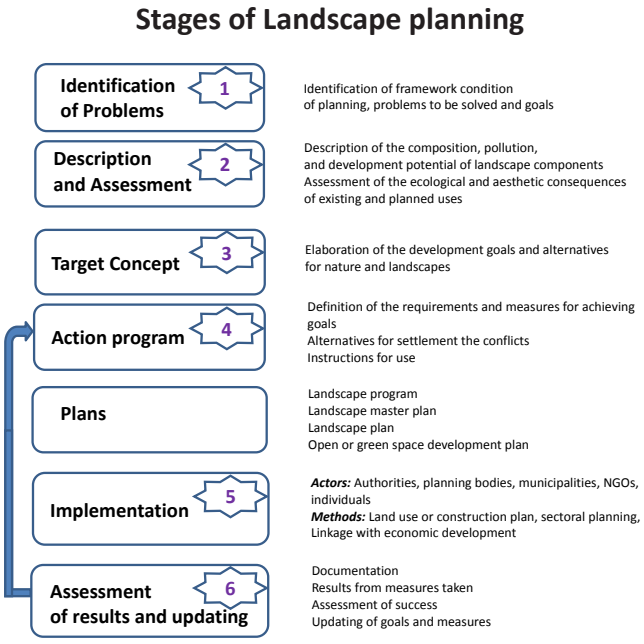

Figure 13. Stages of landscape planning

[1] Tress, G., Tress, B. et al. 2006. Trends in Landscape Research and Landscape Planning: Implications for PhD Students. http://edepot.wur.nl/38273 (accessed 30 March 2017).

§ 7. GOALS OF LANDSCAPE PLANNING

1. ***Systemization.*** Landscape planning is a tool for the systemization and target analysis of information concerning the present status, significance and vulnerability of natural environments and complexes.
2. ***Comprehensive assessment.*** It is a tool for land assessment and evaluation in a broad sense, including the geopolitical position of lands, the strategic prospects for their use, and the adaptation of stipulations to land use in compliance with international standards.
3. ***Management.*** It is a tool that combines, through efficient interaction mechanisms, various agencies and policy-makers at different levels.
4. ***Involvement.*** It is a tool for the extensive involvement of the public in the planning process via accessibility and the high information content of documents generated.
5. ***Weighing.*** It is a tool for searching for optimal decisions in the presence of competing options regarding the utilization of resources and natural complexes, especially in the process of establishing market relationships.

   Transparency. This tool allows investors to take into account the requirements imposed on projects and make proper, timely decisions regarding the advisability of implementing them. Thus, a high investment attractiveness of the area involved is produced.[1]

The ***content of landscape planning*** is generally the protection of:

1) biodiversity;
2) the performance and functionality of the ecosystem, including the ability to regenerate and sustainably use natural resources; and
3) the diversity, uniqueness, beauty and recreational value of nature and landscape. The main task of landscape planning by law is to concretize the aims of nature and landscape conservation for each planning area and to show requirements and measures for administrational procedures to reach these aims.

Landscape plans should contain ***information*** about:

1) the existing and the expected state of nature and landscape;
2) the concretized aims of nature conservation and landscape management;
3) the evaluation of the existing and expected state of nature and landscape according to the given aims including resulting conflicts.[2]

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[1] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers, p. 6-7.

[2] Bundesnaturschutzgesetz. *2009. Federal Nature Conservation Act on 29 July 2009,* § 9.

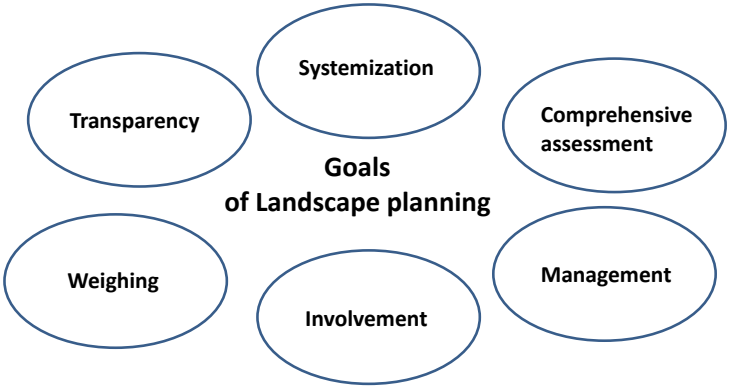


Figure 14. Goals of landscape planning

Principles of landscape planning

General principles of landscape planning are expressed in the fundamental articles of the European Landscape Convention:

A. Consider the territory as a whole.
B. Recognize the fundamental role of knowledge.
C. Promote awareness.
D. Define landscape strategies.
E. Integrate the landscape dimension in territorial policies.
F. Integrate landscape into sectoral policies.
G. Make use of public participation.
H. Achieve landscape quality objectives.[1]

Stakeholders in landscape planning

A number of different "players" can participate in landscape planning:

— policy makers and responsible local officials;
— landscape planners from the private sector;
— representatives of nature conservancy authorities involved in landscape planning, or consultants;
— representatives of sectoral planning institutions (urban, rural, forestry, water, transport);
— representatives of trade unions, farmers' unions, chambers of commerce and industry;

[1] Defining Landscape Democracy Conference. 2015. Centre for Landscape Democracy Norwegian University of Life Sciences, NMBU. https://www.nmbu.no/download/file/fid/13447 (accessed 5 April 2017).

— social groups (environmental associations, local folklore, history and economy groups, sportsmen, anglers, gardeners, and churches); and
— interested individuals.[1]

Joint work can take a variety of forms, such as sharing information, periodic coordination with various sectoral experts or commissions, or formation of working groups. Landscape planners serve as moderators in such coordination efforts. At initial meetings, arrangements can be made for a division of labour and on the conditions of interaction. At the different levels of planning, it is useful to set up working groups that will be responsible for the interaction between participants in the process, according to various criteria.[2] Thus, at the state and regional levels, it is advisable to include both planners and representatives of state-level nature conservancy authorities and of other administrative agencies involved with elements of the environment and nature.

Landscape planning policy is an instrument in the hands of public authorities which use is a political responsibility. It should result in an organization of space that expresses, in its distribution of human being and their activities, and in the quality of human environment created or adapted to our own time. A thoroughly modern concept, landscape combines all four elements of sustainable development: natural, cultural, social and economic. It is also a constantly evolving story. A unique setting and meeting place for populations, landscape is a key factor in the physical, mental and spiritual being and well-being of individuals and societies.[3]

[1] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers, p. 30.

[2] Ibid.

[3] Defining Landscape Democracy Conference. 2015. Centre for Landscape Democracy Norwegian University of Life Sciences, NMBU. https://www.nmbu.no/download/file/fid/13447 (accessed 5 April 2017).

CHAPTER 6
RUSSIAN POLICY AND REGULATIONS OF LAND USE

Throughout human history, land has played a significant role in society. Land has been the focus of productive activities and a source of political power in any state. All nations in the world are land based units, whose boundaries reflect social, cultural and political identity. Land is a principle instrument in fostering social justice, development, provision of decent dwellings and health conditions. Land represents an important resource for the economic life of a majority of people in the world. The way people handle and use land resource is decisive for their social and economic well-being as well as for the sustained quality of land resources. Land use however is not only a realm of those directly using it; it is exposed to part of the wider reality of social and economic development and change. Land use therefore is a highly dynamic process. This implies that policy formulation and development planning need to be based on a sound understanding of these dynamics.

It is becoming more and more evident that land use changes which are made at the national, regional, and local levels of government are affecting the economy, the environment, and most important, the lives of people. Sometimes these changes have global effects. That is why any state must pay very close attention to land-use policy and regulations within its boundaries. Land-use regulations vary tremendously in shape and scope across the world, since in every state these regulations have become more widespread and stringent over time. To supply over a long period of time sufficient and qualitative lands (among other natural resources) to the future generation Arctic states must systematically regulate land use in a restrictive manner.

§ 1. THE FRAMEWORK OF LAND-USE REGULATIONS IN RUSSIA

Land-use regulation in the Russian Federation is one of the most controversial pieces of the domestic legislation. For example, the draft of the present Land Code had been discussed in the Russian Parliament for more than 8 years and was the subject of heated

debate in the Russian society. As the result of land reform a new legislation on land use was being enacted in Russia in the period from 2001 to 2009.[1] The conceptual framework reflected in the new land legislation clearly identifies the role of land in society. According to the principles stated in the Land Code, land is the basis of human life.[2] The regulation of land use and protection is based on the "triple nature" of land – land is a natural resource, a real estate, and an object of ownership. The possession, disposal, and use of land parcels by owners can be carried out freely unless it makes adverse impact on environment.[3]

Table 5

Laws regulating land use in Russia

Legal act	Year of enactment	Purpose
On Land Reclamation	1996	Improvement of lands' quality
On Government Regulation of Agriculture Lands Fertility	1998	Legal instruments to provide for land fertility
Land Code	2001	Basic principles, frameworks for land relationship, rights to land plots, privatization of lands, state functions, land protection, legal regimes for land categories
On Land-Use Planning	2001	Legal foundations for land use planning, frameworks for rational use of lands, state functions
On Environmental Protection	2002	Protection of environment and resources, land protection, landscape definition, requirements for human activities on lands
On Transfer of Agricultural Lands	2002	Regulation of transactions with land plots (sale and purchase)
Urban Code	2004	Regulation of settlement areas, spatial planning, requirements for construction and building works and products
Forest Code	2006	Basic regulations of forest lands, state functions, forest management, public and private forests, protection of forests, transactions with forest lands
Water Code	2006	Basic regulations of water areas, state functions, water management, public and private water objects, legal regime for lands adjacent to water objects, transactions with lands adjacent to water objects

[1] *See also:* Kratzke, W. P. 2003. *Russia's New Land Code: a Two Percent Solution.* University of Memphis – School of Law, Research Paper No. 84.

[2] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. SZ RF 44: 4147.

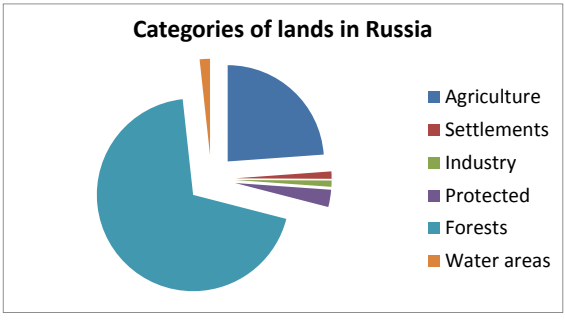
[3] Overchuk, A. L. *Integrated approach to land policy, development of land administration institutions and land market in the Russian Federation.* FAO Corporate Document Depository. http://www.fao.org/docrep/006/y5026e/y5026e0e.htm (accessed 5 April 2017).

Table 5. Continued

Legal act	Year of enactment	Purpose
State Cadaster of Property	2007	Legal regulations of land records and registration, valuation of lands
Civil Code	1994/2017	Regulation of transaction with land plots

The core principles for the use of land are stated by the Land Code and other legal acts of the Russian Federation. They include:

— the assumption that land is the most important component of environmental and production assets in agriculture and forestry;
— human life and health is the first priority in any activity on lands;
— the most valuable lands and specially protected territories are preserved;
— lands are classified and mapped into categories in accordance with their target purpose;
— land-use fee is charged from the land users and administered by municipalities;
— citizens and non-governmental organizations (associations) take part in the decision-making concerning land use.[1]



Agriculture lands – 386,5 mln ha, 22 %
Settlement lands – 20 mln ha, 1,2 %
Industry lands – 16,9 mln ha, 1 %
Protected areas – 46,8 mln ha, 2,7 %
Forest lands – 1 122,3 mln ha, 65,6 %
Water areas – 28 mln ha, 5,2 %
Uncategorized – 89,3 mln ha, 52 %

Figure 15. Categories of lands in Russia

[1] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 1.

The main feature of land-use regulations in the Russian Federation is that lands are categorized by the purposes of their use. According to the Land Code of the Russian Federation there are seven "**categories of lands**":

1) agricultural lands;

2) settlement lands;

3) lands for industry, energy objects, transport, broadcasting, television, lands for space activity, military objects, and other special purposes;

4) lands of specially protected areas and sites;

5) forest lands;

6) water areas;

7) uncategorized lands.[1]

The idea of this differentiation of lands is highly directional definition of land function (place for industrial development, place for recreation, etc.). The main target of dividing lands into categories is in establishing of legal regime of the territory and further territorial zoning for the most effective use of lands.

§ 2. LAND-USE PLANNING IN RUSSIA

International regulations (especially at the level of the European Union) contain requirements and models for land-use planning. Implementation of the principles and basic methodological models do not imply the direct duplication of international rules within one particular state. Russia has specific conditions which need to be taken into account when establishing land-use planning tools in the country:

1. Vast territories are still natural landscapes, especially those in the Far North (Arctic). This is a key factor in the significant difference in practices used to analyze the state and stability of natural systems, and their dynamic and evolutionary patterns in the context of active economic expansion. At the same time, while in European countries concerns of landscape conservation and improvement may prevail over those of socioeconomic development, under Russian conditions, the goals of raising the living standard of the population usually retain priority in the decision-making process.[2]
2. A major part of Russia's territory has been poorly studied to date. This is especially true for the Arctic territories which ecosystems remain distant and poorly understood. All this raises the necessity of the development and implementation of innovative mapping methods, the elaboration of umbrella approaches, the extrapolation and interpolation of the previously obtained data, and the use of remote-sensing technologies.

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[1] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 7.

[2] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers, p. 7.

3. In Russia ecological planning is not implemented effectively. On the one hand, the planning procedures are not distinct in the legislation; on the other hand, there is not proper allowance for it in the national budgetary system.[1] In this case, it could be wise to use oil and gas industry revenues for socioeconomic development, and to create integrated plans of well-balanced, mutually reinforcing social-ecological-economic development. It seems realistic that, already in the early planning stages, landscape plans should be integrated into the plans for such development at the various administrative levels.
4. The public has not yet been properly involved in the planning process, and the public at large does not feel interested in such procedures and the state still lacks effective techniques and methods of public involvement in land-use planning. More effort is needed to establish an ecological culture and build capacity among young generation.

The basic documents regulating land-use planning in Russia are the Land Code (2001) and the Urban Development Code (2004). The scope of the first one is land-use planning on agriculture lands, while the latter regulates spatial planning in the settlements and residential areas. The Land Code includes the definition of land-use planning: ***"set of instruments used for monitoring, planning effective land-use and land protection, identification of certain lands, regulating agricultural lands used by people, companies and indigenous people"***.[2] Land Code also stipulates public and private land rights and legal regime regarding different land categories.

The following works are principal for the land-use planning:

— inspection of the state of lands including surveys and cartography, examination of soil, and other researches and surveys, examination of the land quality, inventory of lands;
— planning and organization of rational utilization of lands and protection of lands;
— territorial organization of lands including development of new and regulating of present ownerships;
— existing land objects as well as land-surveying, land consolidation, land subdivision, allotment, real property formation;
— utilization of lands inside farms.[3]

There are other federal laws and by-laws, substantial for land-use planning:

— Law on Cultural Heritage of Russia (2002);
— Law on Sanitary-Epidemiological Safety in the Russian Federation (1999);

There are several environmental laws that impact land-use planning in Russia, mostly, for protected natural landscapes, forest lands and lands under water objects:

— Law on Environmental Protection (2002);
— Regulations on Environmental Impact Assessment (1995, 2000);
— Water Code (2006);

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[1] Antipov, A. N., Kravchenko, V. V., Semenov, Yu. M. et al. (eds.). 2006. *Landscape Planning: Tools and Experience in Implementation.* Irkutsk: V. B. Sochava Institute of Geography SB RAS Publishers, p. 7.

[2] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 68.

[3] Volkov, S. 2007. *Land Administration System in Russian Federation.* Strategic Integration of Surveying Services, Hong Kong SAR, p. 4/7.

— Forest Code (2006);
— Law on Prevention of Emergent Situations of Natural and Anthropogenic Character (1994);
— federal legislation on transport;
— sanitary norms, building codes.

§ 3. SPATIAL PLANNING IN RUSSIA

After the Second World War spatial planning in the Soviet Union evolved rapidly because at that time the government paid much attention not only to the allocation of industrial sites but also to social development. The central element of the spatial planning system in the USSR was ***"district land planning"*** (rayonnaya planirovka). ***"District land planning"*** was an urban development planning system, which used effective mechanisms for locating industries, cities and other settlements, transport, engineering communications and recreational areas. It applied a coherent assessment for the whole territory and considered geographical, economic, architectural, technical and environmental aspects.[1]

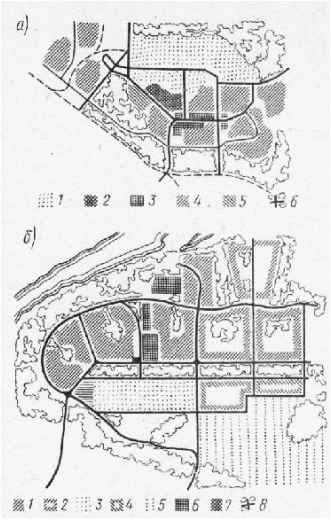

Figure 16. Sample of the district land planning (rayonnaya planirovka).
Figure published at the website Stroy-Spravka[2]

[1] Vladimirov, V. V., Fomin, I. A. 1995. *Osnovy rajonnoj planirovki* [Basics of regional planning] Vysshaja shkola.

[2] Строй-справка.ru. http://stroy-spravka.ru/article/ponyatie-o-raionnoi-planirovke (accessed 5 April 2017).

In the 1990s the Soviet system of spatial planning almost stopped working because of finance problems. In the beginning of the 2000s strategic social and economic development became necessary and public authority had to reintroduce the system of spatial planning. The milestone of this period was the adoption of the new Urban Development Code. This document regulated the updated system of spatial planning. In the Urban Development Code of Russia spatial planning is defined as ***"planning of a territory development (…) which aims at determining territory functions and considering social, economic, environmental and other values of the territory for its sustainable development"***.[1] This definition shows that the main objectives of spatial planning in Russia now are sustainable development of territories and consideration of public interests. It is the key characteristic of the new planning system, as the old system focused on effective location of industries and settlements. Spatial planning under the Land Code is focused on managing different landscapes in the framework of seven land categories such as agriculture lands, settlements lands, industry lands; protected areas, forest lands, water areas; uncategorized lands.[2]

In Russia, the new system of spatial planning appeared as an outcome of democratic processes and state reforms of the 1990s. Russian researchers who studied European patterns of planning[3] contributed a lot. The basic principles of this new system – sustainable development and human rights – were borrowed from the European spatial planning system. Similar to the Soviet planning system the basic levels of planning are regional (administrative oblast, republic, autonomous area) and municipal.

The key document of this planning level is the ***"territorial planning scheme"*** which was adopted by the new Urban Development Code in 2004.[4] Territorial planning has instruments to link the objectives of resource use, management and social-economic development of the region. Today, all regions of the Russian Federation and almost all municipal districts work out such territorial planning schemes.

In today's Urban Development Code of the Russian Federation it is determined that the main objective of spatial planning is sustainable development of territories. The regions of the Russian Federation have to adapt their own urban legislation accordingly. This process is not completed yet. The main drawback of spatial planning regulations in

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[1] Gradostroitelnyi Kodeks Rossiiskoi Federatsii [Urban Development Code of the Russian Federation] No. 190-FZ. 2004. *SZ RF* 1 (1): 16, art. 9.

[2] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 7.

[3] *For more information see*: Perzik, E. N. 2006. *Rajonnaja planirovka (territorial'noe planirovanie) [District planning (spatial planning)].* Moscow: Gardariki; Vilner, M. Ja., Titkow, S. B. 2012. 'Nekotorye aspekty territorial'nogo planirowanija v FRG' [Some aspects of territorial planning in Germany] *Gradostroitel'stvo [Urban construction]* 1 (17): 26-35; Skatershhikov, S. V., Chistobaev, A. I. 2014. 'Principy territorial'nogo planirovanija i ih realizacija v Evropejskom Sojuze i Rossijskoj Federacii' [The principles of territorial planning and their implementation in the European Union and the Russian Federation] *Baltijskij region* 1 (19): 137-148.

[4] Gradostroitelnyi Kodeks Rossiiskoi Federatsii [Urban Development Code of the Russian Federation] No. 190-FZ. 2004. *SZ RF* 1 (1): 16, art. 10.

the present legal system is that it is not focused on functions and features of landscapes and does not provide for sustainable development of all natural elements coherently – lands, waters, forests, air, climate, aesthetics of landscape.

§ 4. LANDSCAPE PLANNING IN RUSSIA

Landscape planning is not new to the theory and practice of spatial planning in Russia.

The failure to create a viable system of spatial planning that considers landscapes, economic objectives and population has made it necessary to use other planning instruments, bringing the role of landscape planning more into focus. After the collapse of the USSR, Russia was open to active cooperation with the Western countries, also in the field of environmental planning. In 1992, a cooperation of Russian and German experts in the field of environmental conservation was established. Within this cooperation, different projects were started and among other things, the tool of landscape planning was identified as an opportunity for the more effective consideration of ecological concerns in the Russian spatial planning system. The first systematic approach to implement landscape planning was introduced in 1994 when the project of environmental planning was launched in the Baikal region. This long-term project was governed by the German Advisory Council for Environmental Issues and included researchers from both German and Russian institutions. Further research was conducted in the Institute of Geography of the Siberian Division of the Russian Academy of Sciences.

After the first Russian-German project, there was a boom of landscape planning works in Russia. The phrase "landscape planning" became one of the most popular in the geographical literature. At that time the Russian scientists had developed several projects on landscape planning: in the Vladimir, Yaroslavl Regions, the Perm Territory; landscape program of the Kaliningrad Region; landscape program for balanced agricultural use (the Altai Territory), and others. Currently, landscape planning is used in such Russian regions including Altay, Yaroslavskaya and Kaliningradskaya Oblasts.

Box 9. Landscape experience in Russia

However, land use and environmental legislation in Russia still lacks the comprehensive approach according to landscape planning. Moreover, there is neither a legal definition of "*landscape*" nor "*landscape planning*". Mostly the latter is considered to be a part of spatial planning, but there is no integral evaluation for different landscapes considering the economic, social and ecological functions of territories. Landscape planning is not legally binding and not performed on a regular basis in Russia, although it is carried out voluntarily in some Russian regions.

The opinions about the necessity and possibility of this form of planning in Russian are divided. More and more scientists believe that the use of landscape planning procedures as an independent procedure of territorial planning in the Russian practice is difficult if possible at all.[1] The main reasons are legal and economic constraints.

[1] Kievskaya, E. 2006. 'Territorialnoe planirovanie v zarubezhnyh stranah' [Territorial planning and zoning in the foreign states]. *Zemleustroistvo, kadastr and monitoring zemel [Land management, cadaster and land monitoring]* 4: 20-25.

Photo 13. City of Labytnangi, Yamalo-Nenets Autonomous District. Taken by Victor Kenig

Legal restrictions are created by the present Urban Development Code (2004), which defines a system of spatial planning in general, and does not describe landscape planning as an independent form of territorial planning. Furthermore, specialists and researchers criticized the new Urban Development Code because its priority is to regulate the development of settlements, but not environmental protection, and because it does not incorporate special tools of environmental planning. Territorial planning documents of the Urban Development Code only describe boundaries of territories that should be used under special conditions.[1] Another reason of insufficient legal regulation of landscape planning is the present Russian system of "land categories".[2] Economic constraints for environmental planning appear because of problems in the Russian economy. Furthermore, the process of updating territorial planning schemes has just been finished in most administrative territories of Russia accordingly to the current land and urban legislation. For many municipalities it is impossible to provide for one more procedure of territorial planning – it would be neither economically nor legally justified.

Currently, there has been some decline in interest to landscape planning in Russia. At the same time, landscape planning can serve as the most effective instrument for planning and using the Arctic lands.

[1] Sazonov, Je. V., Smoljaninov, V. V. 2010. 'Zarubezhnyj opyt realizacii jekologicheskih zadach v dokumentah territorial'nogo planirovanija' [Foreign experience in the implementation of environmental objectives in territorial planning documents]. In: *Nauchnyj vestnik VGASU. Stroitel'stvo i arhitektura* [Scientific Bulletin VGASU. Construction and architecture] 1 (17): 183-184.

[2] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 7.

§ 5. LAND MANAGEMENT IN RUSSIA

In Russia, the "management" functions of public authorities cover both use of natural resource, including lands, management and environmental protection. Both environmental and land legislation proclaim that the actions of federal, regional and local governments are aimed at striking a balance between environmental and economic interests and guaranteeing land rights and interests of individuals and companies provided these rights do not impact the natural environment and other people's interests. While such an overall goal, in theory, is politically appealing, the land management system in Russia has not yet sufficiently evolved to find effective mechanisms for ensuring its achievement.

The evolution of land management in Russia had several phases. The land-use regulations were extensively developing from 1922 to 1990 but there was not a distinct management system in this period. In 1960-1970 some pieces of environmental regulations were formed on the basis of the land legislation. The main objective of environmental laws was to regulate the protection of lands and other resources that were important economically. In the mid and late 1990s, regulatory and institutional frameworks rapidly expanded – specialized federal authorities appeared with functions in land and environmental management. At that stage, special legislation on environmental protection was created and the government started working on new land legislation designed to ensure land rights and regimes for land privatization. Environmental policies were largely guided by the international environmental agenda, most importantly by the outcomes of the Rio Summit and the emergence of sustainable development. During the same period, the activism of the non-governmental sector was encouraged and NGOs were actively involved in environmental and land-use planning.[1]

In 2001 new Land Code was adopted and the system of public authorities involved in land management was formed. In 2000-2004, the need for economic revival totally eclipsed environmental goals.[2] Although authorities often denied this fact, experts and public opinion were quite concerned about the disregard for environmental matters. Such concerns stemmed from the government's focus on large-scale use of lands and natural resources and the commodity-based character of the economy.[3] Since 2004, a new round of reforms introduced a new system of public bodies for land and environmental management as well as new legislation (Forest Code of 2006 and Water Code of 2006) which created a European-pattern system of natural-resource management. In 2009-2016 amendments to the Land Code and environmental legislation have incorporated

[1] Bogolyubov, S. 1989. *Nature protection and nature resources law.* Moscow: Norma.

[2] Environmental Policy and Regulation in Russia: the Implementation Challenge. 2006. OECD Publishing.

[3] Ibid.

even more instruments of sustainable development.[1] Still, social and environmental goals of land use have to be more reconciled.

In Russia land management is carried out at three level:

— the Russian Federation (federal public authorities);
— regions (called "subjects" of the Russian Federation) (regional authorities);
— municipalities or local governments.

Federal level

The functions of the federal authorities in the land management are:

— to formulate the basic principles of regulations and federal policy for land use and protection;
— to develop frameworks of the rights of land owners, land users, land tenants, as well as the basic regulations and restrictions for land market;
— to implement the core tools of land management – planning, monitoring, land-use planning;
— to establish procedures for reservation of lands, land withdrawal including through acquisition or redemption for state needs;
— to develop and implement federal programs for land use and protection.[2]

The system of federal authorities is established by the President of the country and their functions are determined by the Federal Government.[3]

At the federal level, the administrative reform of 2004 pursued the goal of clearly separating policy making, regulatory and compliance monitoring, and service provision functions of government authorities in order to increase the effectiveness of government authorities while reducing the conflicts of interests that arise when these functions are combined. In this context, three types of executive bodies were instituted:

— Federal ministries, which are policy-making bodies. They conduct the problem analysis, development and evaluation of policies in their domains, as well as draft new legislation. Also they coordinate and monitor the activities of federal services and agencies within their jurisdiction. They are not authorized to perform enforcement functions, to manage state property or to provide services.
— Federal services, which are federal executive authorities vested with permitting, inspection and administrative enforcement functions, but are not authorized to develop secondary legislation.
— Federal agencies, which can provide public services and manage state property, maintain various types of registers, but are not authorized to be engaged in regulatory development or perform any compliance assurance functions.[4]

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[1] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147.

[2] Ibid, art. 9.

[3] Constitution of the Russian Federation. 2014. *SZ RF* 31: 4398 Also available online at. http://www.constitution.ru/en/10003000-04.htm (accessed 10 February 2017).

[4] Environmental Policy and Regulation in Russia: the Implementation Challenge. 2006. OECD Publishing.

Today, the key authorities responsible for formulating and implementing the land-use policy as well as environmental policy at the federal level in Russia are the Ministry of Natural Resources (MNR)[1] and the Federal Environmental, Industrial and Nuclear Supervision Service (Rostechnadzor or RTN).[2] The compliance assurance functions were delegated to two federal authorities: the RTN, accountable to the Prime-Minister, and the Federal Supervisory Natural Resources Management Service (Rosprirodnadzor)[3] that is subordinated to the MNR. They supervise industrial impacts and natural resource use, respectively.

Table 6

Land use authorities in Russia

Federal Ministries	Ministry of Natural Resources and Environment	Ministry of Agriculture	Ministry of Economic Development
Subordinated authorities	Federal Supervisory Natural Resources Management Service Federal Service for Hydrometeorology and Environmental Monitoring Federal Forestry Agency	Federal Service for Veterinary and Phytosanitary Surveillance	Federal Service for State Registration, Cadastre and Cartography Federal Agency for State Property Management
Categories of lands	Lands of specially protected areas and sites Forest lands Water areas	Agricultural lands	All categories of lands

Following the administrative reform of 2004, some institutional stability of authorities has been achieved and attempts to streamline their responsibilities and powers have been made. But there is little evidence that the reorganization has achieved its aims as functions are not totally separated and regulators continue to be exposed to political pressure. The overlaps of functions and adversarial relations among various executive authorities have persisted and the level of institutional fragmentation has increased.[4]

[1] Ministry of Natural Resources and Environment of the Russian Federation. Official website. https://www.mnr.gov.ru/english (accessed 5 April 2017).

[2] Federal Environmental, Industrial and Nuclear Supervision Service. Official website. http://en.gosnadzor.ru (accessed 5 April 2017).

[3] Ministry of Natural Resources and Environment of the Russian Federation official website. http://www.mnr.gov.ru/english (accessed 5 April 2017).

[4] Environmental Policy and Regulation in Russia: the Implementation Challenge. 2006. OECD Publishing.

A sectoral approach to the land management system prevails in Russia. Each federal authority administers its own land category and makes decisions only within the narrow limits of its own environmental, economic or social interests. This results in tremendous distortions between sectoral interests and sustainable needs. For example, if mineral deposits are discovered and subsoil use is considered economically feasible and cost-effective, the category of land can be changed by the decision of the appropriate authority, often without consideration or joint decision of the other federal bodies. The exploitation of lands in this case is mainly based on economic criteria without taking into account the impact on the environment or on specific elements of the ecosystem. As a result the system becomes less sustainable. Obviously, the unfavorable economic situation in Russia influences its land management system and gives lower priority to the solution of environmental problems.

Regional level

The functions of the regional authorities in land management are:

- to reserve or withdraw lands for regional needs, including through acquisition or redemption;
- to develop and implement regional programs for land use and protection for the territories inside the administrative borders of the region;
- to administer, use and protect all lands owned by the region.[1]

The system of regional authorities carrying out land management, is established by the regions themselves. In the Russian federal system the constituencies (subjects) of the Federation are defined differently – i.e. republics, krais, oblasts, federal cities, autonomous regions – but they all are equal under the Constitution and have similar powers. Under the Constitution of the Russian Federation the regions have the right to independently determine the system of public authorities, to make decisions on their status, name, order of formation, competence, and other relevant issues. At the same time this principle of regions' independence is not absolute and their power is limited by the provision of the Constitution.[2] The decisions of regions must comply with the fundamentals of the constitutional system and the general principles of organization of representative and executive bodies of state authority established by federal laws.[3]

[1] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 9.1, 10.

[2] Constitution of the Russian Federation. 2014. SZ RF 31: 4398, part 1, art. 77. Also available online at. http://www.constitution.ru/en/10003000-04.htm (accessed 10 February 2017).

[3] SZ RF. 1999. 42: 5005.

§ 6. LAND USE IN YAMAL REGION

One rapidly developing area of the Russian Arctic is the Yamalo-Nenets Autonomous District, a large parcel of land jutting out into the Kara Sea above the Arctic Circle.[1] The Yamal Peninsula where the District is mostly located, stretches some seven hundred kilometers into the Arctic Ocean from the Russian mainland. Known to its indigenous inhabitants as 'the end of the world', this area of the Russian Federation is arousing international attention.[2] Yamal Peninsula's physical structure is unique with permafrost over 300 meters deep in some areas. Lakes and rivers are rich with fish, and on the tundra reside the world's largest reindeer herd. The peninsula is also the location of Russia's largest known untapped gas reserves.[3]

Figure 17. Yamalo-Nenets Autonomous District
on the map of the Russian Federation (green colour)

The Yamalo-Nenets Autonomous District lies entirely within the low Arctic tundra and continuous permafrost zones. Ice-rich permafrost is common and the landscapes range from moderately to highly unstable.[4] Tundra and forest tundra occupy three-fifths

[1] Norman, Ch. and Andreeva, E. Gas Development in Northwest Siberia. http://arcticcircle.uconn.edu/NatResources/gasdev.html (accessed 5 April 2017).

[2] Yamal Peninsula. Future World project. http://www.futureworldproject.org/story/yamal (accessed 5 April 2017).

[3] Norman, Ch. and Andreeva, E. Gas Development in Northwest Siberia. http://arcticcircle.uconn.edu/NatResources/gasdev.html (accessed 5 April 2017).

[4] Vilchek, G. E. and Bykova, Y. 1997. 'The origin of regional ecological problems within the northern Tyumen Oblast'. *Russian Arctic: Arctic and Alpine Research* 24: 99-107.

of the district; sphagnum bogs cover vast areas.[1] Forests of Siberian larch, spruce, and nut pine occur in the south, primarily along river banks.[2] The relative biodiversity of Yamal on a global scale is insignificant, but does include some rare and ecologically vulnerable species. About 10 species of birds and small mammals and seven species of vascular plants are listed in the Red Book.[3]

The basis for Yamal's traditional economy is the seasonal exploitation of extensive tundra "pastures".[4] Traditional use of natural resources and nomadic reindeer herding is a way of life for the Nenets communities in the Arctic. These northern indigenous peoples continue to rely on the sustainable use of renewable resources. This dependence puts them at great risk from industrial objects and pollutants that find their way in the period of the intensive economic development.

Nowadays the indigenous peoples in the Arctic regions have to use alternative ways of their economic development, at the same time they are seeking to balance these emerging opportunities with their traditional lifestyle and values closely connected with the land and wildlife. A good example here is the indigenous peoples of the Yamalo-Nenets Autonomous District with 40 % leading a traditional nomadic life, living right in the forest tundra[5] and sharing their traditional territories with the major Russian oil and gas companies (Gasprom, Rosneft and others).[6]

Reindeer herding and fishing are traditional for the indigenous activities of the region. In 2015, the Yamal's domestic reindeer population amounted to 678 thousand heads, 360 thousand of which are in farm households.[7] The Yamal Peninsula is extensively grazed in summer by large reindeer herds belonging to the Nenets.[8]

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[1] Forbes, B. C. 1999. 'Land use and climate change on the Yamal Peninsula of north-west Siberia: some ecological and socio-economic implications'. *Polar Research* 18 (2): 367-373.

[2] Yamal-Nenets autonomous district. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[3] Chernov, Yu. I. (ed.). 1997. *Krasnaya Kniga Yamalo-Nenetskii Avtonomny Okrug* [Red Book of the Yamal-Nenets Autonomous Okrug]. Ekaterinburg: Urals University Press.

[4] Forbes, B. C. 1999. 'Land use and climate change on the Yamal Peninsula of north-west Siberia: some ecological and socio-economic implications'. *Polar Research* 18 (2): 367-373.

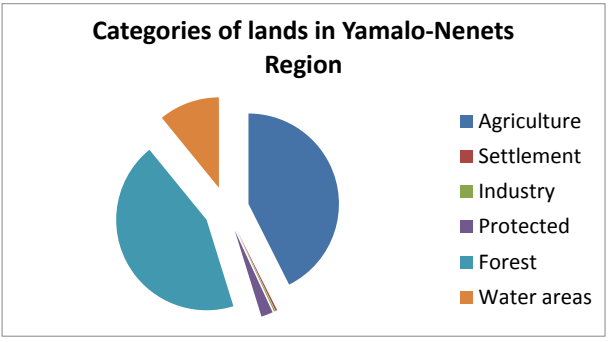
[5] News Agency "Arctic-Info". 2016. Indigenous peoples. http://www.arctic-info.ru/news/chislennost-korennogo-naseleniya-v-yanao-sostavlyaet-pochti-42-tysyachi-chelovek (accessed 5 Decembet 2016).

[6] Gasprom official site. 2008. http://www.gazprom.ru/press/news/2008/april/article56528 (accessed 15 January 2016).

[7] Yamal-Nenets autonomous district. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[8] *For more information see:* Forbes, B. C. 1999. 'Land use and climate change on the Yamal Peninsula of north-west Siberia: some ecological and socio-economic implications'. *Polar Research* 18 (2): 367-373; Martens, H., Magomedova, M. and Morozova, L. 1996. *Rangeland studies in the Bovanenkovo Proposed Development Area: year 3.* Report prepared for AMOCO Eurasia Production Co., Calgary, Canada: Harvey Martens & Assoc.

The Yamal region has long-term perspectives of social and economic development due to resources of oil and gas discovered there in 1960s and being explored now. These resources are becoming readily available because of climate change – induced melting of permafrost and sea ice. The state-run monopoly – Gazprom – intends to develop gas deposits in the region as a major source of fuel for Europe. Large investment projects were worked out and are being implemented on the territory of the autonomous district: gas production being an outpost for the future movement onto the Arctic shelf. In last decades, the Yamalo-Nenets Autonomous District has become one of the leading Russia's regions. It has been transformed from a raw-material province to strategic entities of the Russian Federation and gained recognition both in Russia and far beyond. Therefore, currently, there is active industrial development including drilling, construction of a liquefying natural gas plant, construction of gas storage, marine port, shipping infrastructure, roads and railway.



Agriculture lands – 30 531,4 thousand ha, 39,74 %
Settlement lands – 212,6 thousand ha, 0,28 %
Industry lands – 196,6 thousand ha, 0,26 %
Protected areas – 1 509,5 thousand ha, 1,96 %
Forest lands – 31 685,5 thousand ha, 41,19 %
Water areas – 7 814,3 thousand ha, 10,16 %
Uncategorized – 4 975,1 thousand ha, 6,47 %

Figure 18. Categories of lands in the Yamalo-Nenets Autonomous District[1]

[1] Схема территориального планирования Ямало-Ненецкого автономного округа [Territorial Planning Scheme of Yamalo-Nenets Autonomous District]. Доклад об экологической ситуации в Ямало-Ненецком автономном округе в 2015 году [Report on Natural Environment in Yamalo-Nenets Autonomous District in 2015]. Salekhard. http://docs.cntd.ru/document/473407002 (accessed 10 April 2017).

Oil and gas exploration and production operations have the potential for a variety of impacts on the environment and resulted in the direct withdrawal of large areas for infrastructure development. Associated disturbance regimes have led to cumulative impacts on thousands of additional hectares of land.

These 'impacts' depend upon the stage of the process, the size and complexity of the project, the nature and sensitivity of the surrounding environment and the effectiveness of planning, pollution prevention, mitigation and control techniques. Many of the impacts are potential and, with proper care and attention, may be avoided, minimized or mitigated.[1]

Potential impacts to soil arise from three basic sources:

— physical disturbance as a result of construction;
— contamination resulting from spillage and leakage or solid waste disposal; and
— indirect impact arising from opening access and social change.

Alterations to soil conditions may result in widespread secondary impacts such as changes in surface hydrology and drainage patterns, increased siltation and habitat damage, reducing the capacity of the environment to support vegetation and wildlife.

In addition to causing soil erosion and altered hydrology, the removal of vegetation may also lead to secondary ecological problems, particularly in situations where many of the nutrients in an area are stored in vegetation; especially in the Arctic where natural vegetation recovery is very slow. The low Arctic tundra lies entirely within the continuous permafrost zone and ice-rich substrates are widespread. One implication of this is that both anthropogenic and zoogenic disturbance regimes may easily initiate erosion, leading to significant further losses of pastures. Even without industrial disturbance, a slight change of the climate would result in massive thermokarst erosion. This would have negative consequences equal to or greater than the mechanical disturbances of lands.[2]

Soil contamination may arise from spills and leakage of chemicals and oil, causing possible impact to both flora and fauna. Simple preventative techniques such as segregated and contained drainage systems for process areas incorporating sumps and oil traps, leak minimization and drip pans, should be incorporated into facility design and maintenance procedures. Such techniques will effectively remove any potential impact arising from small spills and leakage on site.

In terms of the surface area covered, roads and off-road vehicle traffic are two of the most extensive anthropogenic disturbance types in boreal and Arctic regions, with numerous direct and cumulative impacts. On southern Yamal, both a railway and an

[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[2] Forbes, B. C. 1999. 'Land use and climate change on the Yamal Peninsula of north-west Siberia: some ecological and socio-economic implications'. *Polar Research* 18 (2): 367-373.

adjacent service road have been constructed since the late 1980s between Obskaya and Paijuta, a distance of more than 210 km. This transport corridor continues to expand further north each year on the western portion of the peninsula, supplying labour and materials for the infrastructure that will eventually support construction of the gas pipeline(s) from Bovanenkovo, either northwest to Kharasavei or south-west to the existing pipeline network.[1]

Other key impacts may also include changes in:

— land-use patterns, such as agriculture, fishing, logging, hunting, as a direct consequence (for example land-take and exclusion) or as a secondary consequence by providing new access routes, leading to unplanned settlement and exploitation of natural resources;
— local population levels, as a result of immigration (labour force) and in-migration of a remote population due to increased access and opportunities;
— socio-economic systems due to new employment opportunities, income differentials, inflation, differences in per capita income, when different members of local groups benefit unevenly from oil and gas industry;
— socio-cultural systems such as social structure, organization and cultural heritage, practices and beliefs, and secondary impacts such as effects on natural resources, rights of access, and change in value systems influenced by foreigners;

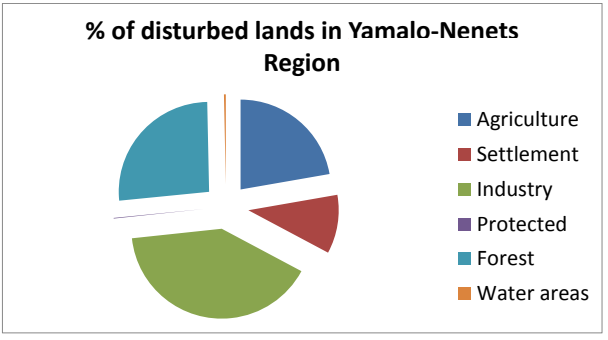


Figure 19. Disturbed lands in the Yamalo-Nenets Autonomous District[2]

[1] Forbes, B. C. 1999. 'Land use and climate change on the Yamal Peninsula of north-west Siberia: some ecological and socio-economic implications'. *Polar Research* 18 (2): 367-373.

[2] Государственный (национальный) доклад о состоянии и использовании земель в Российской Федерации в 2015 году [State (national) report on the state and use of land in the Russian Federation in 2015]. Ministry of Economic Development of the Russian Federation, Federal Service for State Registration, Cadastre and Cartography official website. https://rosreestr.ru (accessed 17 March 2017).

— availability of, and access to, goods and services such as housing, education, healthcare, water, fuel, electricity, sewage and waste disposal, and consumer goods brought into the region;
— planning strategies, where conflicts arise between development and protection, natural resource use, recreational use, tourism, and historical or cultural resources;
— aesthetics, because of unsightly or noisy facilities; and
— transportation systems, due to increased road, air and sea infrastructure and associated effects (e.g., noise, accident risk, increased maintenance requirements or change in existing services).[1]

As the result of all alterations the area of disturbed lands is growing every year in Yamal. The region is characterized as having the biggest area of disturbed lands of all categories in Russia. The synergistic effects of land use coupled with climate change therefore will certainly have profound implications for the ecosystems of Yamal, as well as the future of the Nenets culture, society and economy.[2]

§ 7. LAND MANAGEMENT IN YAMALO-NENETS AUTONOMOUS DISTRCT

In Yamalo-Nenets Autonomous District public authorities pay special attention to land management. Effective use of lands and sustainable development of the territories is one of the first priorities of regional and municipal authorities.

The regional authority for land management Yamalo-Nenets Autonomous District is the Department of Property Relations. Included in the structure of this body there is the Bureau of Land Management which manages lands across the region. The main functions of the Bureau are:

— the right to possess, use the land and dispose of the lands owned by the autonomous region;
— transfer of lands from one land category to another at the request of the federal executive bodies or municipalities;
— land-use planning on the regional level for mapping settlement area boundaries in the region;
— withdrawal of lands for regional needs;
— development and management of regional programs for land use and protection;
— records of all public lands and cadaster valuation of lands in the region;
— mapping of land plots and determination of their legal regime;

[1] Environmental Management in Oil and Gas Exploration and Production. 1997. Joint E&P Forum/UNEP Technical Publication. http://eandpforum.co.uk (accessed 17 March 2017).

[2] Ibid.

— allocation of property rights and other rights to land;
— land control and surveillance.[1]

The land use is regulated by two laws of the autonomous region: "On Some Issues of Relationship to Land in the Yamalo-Nenets Autonomous District" (2009) and "On Land Use and Protection in the Territories of Traditional Habitat and Activities of the Northern Indigenous Peoples in the Yamalo-Nenets Autonomous District" (1997). The objectives of the regional legislation related to lands are to regulate land use and protection considering the interests of indigenous peoples and their communities in the territory of the autonomous region, to ensure rational use and to effectively combine land use for industry and traditional activities of indigenous peoples. For this special land-use regimes are established and targeted to preservation and improvement of the natural environment. The regional legislation includes certain rules for the protection of indigenous peoples, rights to lands and for ensuring their sustainable traditional economic activities.

Part 3 of Article 7 of the Land Code of the Russian Federation reads that the regions of the Russian Federation and municipalities can regulate the use of lands and set a special legal regime for certain territories, for example of traditional occupation and lifestyle of indigenous peoples, if these laws do not contradict federal legislation. Thus, the regional authorities are vested with the powers to regulate land issues and therefore they can fill the gaps of federal regulations. But the problem is that the Land Code itself restricts the authority of regional legislature in land issues. It happens because the federal land laws (Land Code and others) regulate the whole set of issues concerning land rights, procedure of land granting, land transactions, disposal of lands, preservation of lands, etc. The Land Code sets the legal regime of all land categories, including agriculture lands (on which traditional settlements in Yamalo-Nenets district are mostly located). That is why regional legislation just echoes federal rules and cannot comprise special regulations providing for sustainable development of lands.

Lands are of great significance for municipalities, because, on the one hand, they are the sources of municipalities' revenue, on the other hand, effective allocation and use of lands is the guarantee of social and economic stability in the municipal area. Municipal authorities in Yamal are vested with certain powers and make considerable efforts to provide for sustainable land use.

The powers of local self-government bodies in the sphere of land use are:
— reservation of lands and withdrawal, including redemption, land for municipal needs;
— establishing land use and development areas of urban and rural settlements, territories of other municipalities;
— development and implementation of local programs for land use and protection;

[1] Yamalo-Nenets Autonomous District. Public authorities official website. http://правительство.янао.рф/power/iov/imushestvo/about (accessed 2 April 2017).

— other powers to address issues of local importance in the field of land use and protection. The bodies of local self-government have the right to manage and dispose lands which are municipal property.[1]

Local governments are independent from state authorities. The structure of local governments make up a representative body of the municipality, the head of the municipality, the local administration (executive body of the municipality), control and accounting bodies of the municipality, other bodies and elected officials of local government under the charter of the municipality. They all have their own authority to address local issues.[2]

Under the Land Code, local governments determine the land categories, transfer the land plots from one category to another; approve land layout, or land on the territory of the cadastral plan; establish public easements; conclude an agreement on the redistribution of land and (or) land plots; decide on issuing permits for land use or rent; property rights and other rights to land; consider applications of citizens and make decisions on granting of land for different purposes and different rights; consider applications and decide on holding an auction for the sale of land or the auction for the right to sign the land lease contract.[3]

For example, the municipality of Tazovski rayon in the Yamalo-Nenets Autonomous District is vested with the powers concerning lands:

— to establish the rates of land tax;
— to possess, use and dispose lands owned by the municipality;
— to provide and approve territorial planning scheme of municipality, land mapping;
— to reserve and withdraw lands for municipal needs;
— to carry out land control;
— to implement integrated cadastral works and approve local area maps.

In the final analysis, Yamal requires a system of management that is sensitive to rather wide ranging temporal and spatial scales. In the short term, e.g., the next two to three decades, there are critical and immediate threats from changes in land use, including both local and widespread damages from industry and the ecosystem-level effects. In the longer term, if the observed climatic warming continues, we can expect the extensive alteration of existing tundra communities as permafrost begins to thaw and large areas are either denuded by landslides or inundated by a raised water table (caused by melting ground ice and thermokarst). Planning to cope with such changes will require: a) much greater efforts on the part of industry to prevent or mitigate additional disturbance; b) a flexible system of land use, emphasizing property rights, that is satisfactory to both the Nenets and the state; and c) additional knowledge on the composition and potential forage utility of emergent plant communities which will necessarily be exploited by the reindeer.[4]

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[1] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 11.

[2] *SZ RF.* 2003. 40: 3822.

[3] Ibid. 2001. 44: 4147.

[4] Forbes, B. C. 1999. 'Land use and climate change on the Yamal Peninsula of north-west Siberia: some ecological and socio-economic implications'. *Polar Research* 18 (2): 367-373.

CHAPTER 7
INDIGENOUS PEOPLES AND LAND USE

The Arctic is home to and provides livelihoods for four million people, most of whom live in northern Scandinavia and Russia.[1] The goal of the Arctic states exploiting natural resources is to maintain a balance between the industrial development of the northern territories and sustainable development of indigenous peoples.[2]

Around the world, indigenous peoples are fighting for recognition of their right to own, manage and develop their traditional lands, territories and resources.

Land is important for them in two respects. First, traditional lands are the 'place' of the nation and are inseparable from the people, their culture, and their identity. Second, land and resources, as well as traditional knowledge, are the foundations upon which indigenous people intend to rebuild the economies of their nations and so improve the socio-economic circumstances.[3] Land is not only a physical asset with some economic and financial value, but an intrinsic dimension and part of peoples' lives and belief systems.

§ 1. PEOPLES IN THE ARCTIC

In Russia, the northern indigenous peoples include the Aleuts, Koryak, Eskimos, Chukchi, Evenks, Yakuts, Yukagirs, Dolgan, Selkup, Nanai, Khanty, Mansi, Nenets, Saami and others.[4] The northern indigenous peoples traditionally inhabit huge territories stretching

[1] http://kauppakamari.fi/wp-content/uploads/2013/03/Yamalo-Nenets-autonomous-district.pdf (accessed 20 March 2017).

[2] Gladun, E., Chebotarev, G. 2015. 'Participation of the Northern Indigenous Peoples in the Management of the Russian Arctic Territories and Its Legal Protection'. *The NISPAcee Journal of Public Administration and Policy* VIII (1): 116.

[3] Anderson, R. B., Schneider, B. and Kayseas, B. 2008. 'Indigenous Peoples' Land and Resource Rights Research'. *Paper for the National Centre for First Nations Governance.*

[4] News Agency "Arctic-Info". 2016. Indigenous peoples. http://www.arctic-info.com/encyclopedia/indigenous-peoples (accessed 20 March 2017).

from the Kola Peninsula in the west to the Bering Strait in the east, which make up about two-thirds of the Russian territory. They inhabit more than 20 federative regions (or "subjects of the Russian Federation"), including the Republic of Sakha (Yakutia), the Kamchatka Territory, the Krasnoyarsk Territory, the Khabarovsk Territory, the Magadan Region, the Murmansk Region, the Chukotka Autonomous District, the Nenets Autonomous District, the Khanty-Mansi Autonomous District -Yugra and the Yamalo-Nenets Autonomous District.[1]

The northern indigenous peoples use the environment and natural resources for their living sustainably.[2] They are bearers of valuable and unique knowledge about the Arctic landscapes and possess traditional values, culture and skills.[3] Their life-support system is closely linked to traditional lands and land use, to the challenging climate and geography conditions – severe weather, limited natural resources, and dispersed settlements. In small groups the indigenous peoples of the North can easily respond to major climatic and environmental changes by altering group sizes, relocating, and being flexible with seasonal cycles in hunting or employment.[4] Smaller herds and camps of nomadic indigenous peoples are able to respond more flexibly to ecological changes because they can exploit smaller patches of pastures, including those surrounded by industrial installations. Therefore, their number is almost not growing, while the birth rate is high enough.[5] However the same factors which ensured the high degree of adaptability of northern populations to their extreme living conditions also made it difficult for them to integrate with other cultures and to adjust to continuing development of their primordial territories.

§ 2. CHALLENGES TO THE NORTHERN INDIGENOUS PEOPLES

Five main modern challenges for indigenous peoples of the Arctic have been outlined at Gargia Conferences for Local and Regional Development. These are:

1. ***Globalization.*** People established communities and cultures in the Arctic thousands of years ago, and continue to thrive today. They have developed smart, innovative ways to adapt to the unique challenges posed by the region's severe climate.[6]

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[1] Batyanova, E. P., Bakhmazkaya, I. V., Vlasova, I. V. and Poplavskaya, X. P. 2009. *Narody Rossii. Atlas Kultur i Religii* [Peoples of Russia. Atlas of Cultures and Religions]. (In Russian). Moscow: Feoria.

[2] Park, E. 2008. 'Searching for a Voice: The Indigenous People in Polar Regions'. *Sustainable Development Law & Policy* 8: 30.

[3] Arctic Monitoring and Assessment Programme. 2004. Persistent Toxic Substances, Food Security and Indigenous Peoples of the Russian North. In: *Final Report: Arctic Monitoring and Assessment Programme Final Report.* Oslo: AMAP Secretariat.

[4] Park, E. 2008. 'Searching for a Voice: The Indigenous People in Polar Regions'. *Sustainable Development Law & Policy* 8: 30.

[5] Artyunov, S. 2015. Почему исчезают северные народы? [Why do the northern peoples disappear?] Укрепление гражданского единства и гармонизация межнациональных отношений в Санкт-Петербурге [Strengthening civil unity and harmonization of interethnic relations in St. Petersburg]. http://nacionalsoglasie.kmormp.gov.spb.ru/narody-rossii/malye-narody-severa-i-dalnego-vostoka (accessed 10 January 2017).

[6] Arctic. National Geographic website. http://www.nationalgeographic.org/encyclopedia/arctic (accessed 30 March 2017).

However, in the 21st century globalization has become a challenge for indigenous peoples as the traditional system of values is being actively reviewed. Western individualistic values, rationality, the desire for material well-being and self-assertion in society, founded on the primacy of consumption are spreading wider and wider. At the same time such values as social responsibility, community teamwork, mutual support, respect for elders, environmental awareness, and others are being actively displaced and lost. This destroys the continuity of generations and leads to the loss of linguistic diversity as well as to the loss of much of the traditional knowledge necessary for human survival.[1]

Notwithstanding cultural and ethnographic differences, indigenous peoples in the Arctic share a common history of assimilation into their various mother states and a lack of recognition of rights on traditionally occupied territories. On this background these peoples have united in working steadfastly towards self-determination. Their primary objective is to safeguard development and traditional activity on traditional lands and waters as well as to share economic benefits of development on these territories.[2]

2. ***Industrialization.*** The northern indigenous peoples stress hydrocarbon development as the main long-term threat to their existence.[3] The consequences of industrialization are the following: focus on subsoil use, the acceleration of assimilation, the reduction of traditional subsistence territories; unprofitable traditional industries, low attractiveness of the traditional economy for young people; environmental impacts.[4] The widespread commercial development of natural resources in all Arctic countries has greatly undermined the foundations of the existence of traditional economic activities of the northern indigenous peoples. In Russia, since the beginning of industrial exploitation of the North of Western Siberia and creation of the largest oil and gas industry, the life of the northern indigenous peoples has changed greatly.[5]

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[1] Shadrin, V. 2004. How are Indigenous peoples and communities in northern Yakutia affected by industrial development? In: Gjertsen, T., Halseth, G. (eds.) *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia. The Gargia Conferences for Local and Regional Development* 14, p. 206.

[2] Fløistad, B. 2010. Comparison of Indigenous Peoples Rights along the Arctic Routes, CHNL. http://www.arctis-search.com/Comparison+of++Indigenous+Peoples+Rights+along+the+Arctic+Routes (accessed 20 March 2017).

[3] *See, for example*: Forbes, B. C., Stammler, F. 2009. 'Arctic climate change discourse: The contrasting politics of research agendas in the West and Russia'. *Polar Research* 32: 253-261; Stammler, F. et al. 2009. *"Ilebts" Declaration on Coexistence of Oil and Gas Activities and Indigenous Communities on Nenets and Other Territories in the Russian North.* Arctic Centre, University of Lapland, Rovaniemi, Finland.

[4] Shadrin, V. 2004. How are Indigenous peoples and communities in northern Yakutia affected by industrial development? In: Gjertsen, T., Halseth, G. (eds.) *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia.* The Gargia Conferences for Local and Regional Development 14, p. 208.

[5] Tyumen North: the History of Development. 2008. Way to Siberia. On-line project. http://www.ikz.ru/siberianway/engl/oilandgas.html (accessed 30 March 2017).

For example, the number of reindeer in Yamal region decreased by 30 per cent in the beginning of the 21st century, though still being the largest in Russia.[1]

Photo 14. Indigenous peoples of Yamal meet with new-comers civilization.
Taken by Elena Gladun, University of Tyumen

On the one hand, the Arctic territories become attractive to the industry comprising exploration and drilling, large infrastructure projects, roads. On the other hand, it is not taken into account that people living in the North and their local communities, are facing a situation where their traditional territories are changing and getting out of their own control. That is true concerning both offshore and terrestrial resources.[2] Industrial development of the Arctic brings new tools and methods, which are not friendly to nature (guns, traps, machines, oil pollution, etc.) and destroy traditional livelihood (youth prefer to live in villages, to have conveniences in everyday life, etc.). It has also rendered traditional livelihoods unprofitable. For example, in the 1970s hunters started to use snowmobiles and helicopters to reach hunting places as opposed to traditional transport using reindeer.[3] An even bigger problem is the denial of aboriginal

[1] Yamal: at the Edge of Millenniums. 2000. *Illustrated Essay on the Region's Hisotry from Prehistoric Times.* Salekhard: ARTVID, Saint Petersburg: Russkaya Collectia, p. 304.

[2] Pedersen, S. The right to traditional resources and development programs. In: *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia.* The Gargia Conferences for Local and Regional Development 14.

[3] Shadrin, V. 2004. How are Indigenous peoples and communities in northern Yakutia affected by industrial development? In: Gjertsen, T., Halseth, G. (eds.) *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia.* The Gargia Conferences for Local and Regional Development 14, p. 208.

rights to land and of access to natural resources. Indigenous peoples of the North who traditionally used their lands for agriculture and reindeer herding have to resettle and look for new occupations. Thus, their ties to the environment are broken and cultural identity has been weakened.

The greatest danger of industrial development in the Arctic is the unknown and unpredictable changes, which can be extremely negative for the nature of the region and the Arctic indigenous peoples.

3. ***Environmental problems.*** Oil and gas operations can have serious direct negative impact on indigenous peoples and their societies, including increased settler population on their lands, decreased local flora and fauna, contamination of water, soil and air, and degradation of valuable lands. This often leads to an increased risk of health problems among indigenous peoples affected, and to loss of or damage to hunting grounds, fisheries, biodiversity, medical plants and spiritual sites, among others.[1]

In Russia, reindeer grazing areas (more than 20 million ha) were fragmented due to the industrial development, hunting areas, and hundreds of rivers have lost their fisheries value due to pollution. Some northern ethnic groups are put under the threat of dying out because of their continued exclusion from native habitat, traditional lifestyle, and ethno-cultural values.[2]

4. ***Climate change.*** The changing climate worsens existing conditions and generates new threats and risks to the indigenous peoples of the Arctic regions. Climate warming increases problems for people and animals because of changing weather patterns, deteriorating water quality due to the strong thawing of permafrost, and the emergence of new species. Arctic ecosystems are destroyed and there is permafrost degradation, which leads to a change in the traditional conditions of food storage. Changing the water regime of rivers and lakes leads to later periods of ice, more frequent floods, increased coastal erosion, and accelerated freeze-out of the remains of the mammoth fauna. Traditional branches of industry – reindeer breeding, hunting, fishing, and gathering are also subjected to serious threats. Most vulnerable to climate change impacts is herding. The main problem is pasture degradation. For the tundra zone, a disaster has been the rapid spread of shrubs, forming in some places, impenetrable thickets.

Access to resources is closely linked to security, which is provided by traditional knowledge accumulated over millennia. But climate change alters that reality, and

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[1] Fjellheim, R. S. and Henriksen, J. B. 2006. 'Oil and Gas Exploitation on Arctic Indigenous Peoples´ Territories'. *Gáldu Resource Centre for the Rights of Indigenous Peoples. Guovdageaidnu/ Kautokeino* 4: 28.

[2] Shadrin, V. 2004. How are Indigenous peoples and communities in northern Yakutia affected by industrial development? In: Gjertsen, T., Halseth, G. (eds.) *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia.* The Gargia Conferences for Local and Regional Development 14, p. 212.

indigenous peoples are increasingly finding themselves in situations where their practice, experience, and knowledge cannot help them. This leads to an increase in the number of accidents, especially those related to the late freeze-up, early frosts, and floods.[1]

In addition, the warming Arctic climate is favorable for its industrial development, so an inevitable consequence of climate change is the increase in industrial loads in the territory. This multiplies the environmental risks produced by the already existing industry: rising levels of pollution, and landscape and geological changes that may lead to habitat destruction through the release of hazardous substances or oil pipeline ruptures.

5. ***Geopolitics.*** The recent years have seen a great increase in the influence of geopolitics on the lives of indigenous peoples. The future of the northern territories is increasingly dependent on global economic and political trends. These include the continued importance of the extraction of mineral and hydrocarbon resources. In this case, the production volumes of non-renewable natural resources, and the related transport infrastructure, will inevitably grow, predominantly from the northern regions. Thus, in the Arctic are concentrated up to 30 % and 12 % of world reserves of gas and oil, respectively.[2]

There is an increasing integration of indigenous affairs into mainstream local, national, and regional government arrangements. Despite differences in political systems, a common feature of Arctic politics is increased indigenous participation in political processes.[3]

The main objective of the Arctic governments should be to provide for participation of indigenous people at all stages of the Arctic development, because their participation in all decisions will contribute to the Arctic sustainability development. The indigenous population of the North cannot be happy when large oil and gas and industrial companies interfere with their life or teach them how to behave. It has become obvious that the northern indigenous peoples are interested not only in the compensation of loss and environmental harm, they do not only demand protection of their rights and interests from the governments, but they want to be involved in the decision-making process and management of their territories and resources. Moreover they are willing to participate in the Arctic resource use and protection according to their traditional values and knowledge. That is the main reason why the governments of the Arctic countries (Canada, USA, Finland, Russia, and others) are trying to find the most effective forms of indigenous participation in the Arctic issues.

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[1] Shadrin, V. 2004. How are Indigenous peoples and communities in northern Yakutia affected by industrial development? In: Gjertsen, T., Halseth, G. (eds.) *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia.* The Gargia Conferences for Local and Regional Development 14, p. 212.

[2] Ibid, p. 213.

[3] Broderstad, E. G. 2004. Political Systems. In: *AHDR (Arctic Human Development Report).* Akureyri: Stefansson Arctic Institute.

Photo 15. Nenets. Taken by Elena Gladun, University of Tyumen

The integral part of this process, which deserves special attention from the Arctic governments, should be the following: improving the regulatory framework to ensure the rights of indigenous peoples of the North to use the land and its natural resources, ensuring legal protection of native habitat and traditional ways of life, development and approval of valuation methodologies and damage to habitats and ways of life caused by the negative effects of industrial resource development, improving the efficiency of conservation and development of northern cultures, and the creation of standards for nature-saving technologies.[1]

§ 3. LAND USE OF INDIGENOUS PEOPLES

In most northern states the right to traditional use of lands, biological and other resources such as reindeer pastures, harvesting fauna, fish, non-wood resources of forest including wild plants is declared with due regard to the priorities of indigenous peoples.[2]

[1] Shadrin, V. 2004. How are Indigenous peoples and communities in northern Yakutia affected by industrial development? In: Gjertsen, T., Halseth, G. (eds.) *Sustainable Development in the Circumpolar North From Tana, Norway to Oktemtsy, Yakutia, Russia.* The Gargia Conferences for Local and Regional Development 14, p. 215.

[2] Gladun, E., Ivanova, K. 2016. Preservation of Territories and Traditional Activities of the Northern Indigenous Peoples in the Period of the Arctic Industrial Development. In: Latola, K., Savela, H. (eds.) *The Interconnected Arctic — UArctic Congress 2016.* Springer International Publishing, p. 136.

However, in practice the northern indigenous communities can hardly get an access to their traditional lands. They cannot become owners of hunting lands, finishing areas, cannot obtain long-term licenses for the wildlife use rights, quotes for fishing.[1] Due to many reasons the northern indigenous peoples are not able to compete with major industrial companies. As a consequence, indigenous peoples do not conduct traditional economic activities, nor do they preserve their traditional lifestyle, values and language.

Land use patterns of indigenous peoples are truly unique and are part of common world culture, an ancient and successful experience of adapting human communities to extreme environmental conditions. This is the difference between the practices of the indigenous communities from the practices of the modern Western civilization.[2] Indigenous peoples lead a lifestyle that is respectful towards the use of natural resources and has minimal impact on the land and resources. Their economy is based on thoughtful examination of natural processes and the desire to harmoniously merge the human world with nature. Indigenous people are only able to conduct their traditional way of life in pristine or slightly disturbed landscapes, which is why one of the main conditions of their existence is supporting the level of biodiversity and productivity of their lands.[3] Traditional methods of land use were and still are the only form and condition for subsistence among the northern peoples. Only these methods guarantee the preservation and reproduction of their distinct cultures and ethnic identities.

Indigenous peoples use several types or strategies of land use and various local variants. Though there are some general rules. The first rule of land use which the indigenous peoples of the North developed and follow up to the present is to "not take from nature more than necessary for survival". The second rule of "few people on a large territory" was developed by indigenous peoples on the experience of many centuries living in extreme conditions, and their preparation in case of sudden, and sometimes catastrophic changes in the level of the hunting and fishing reserves and the state of the pastures. This rule is determined by the slower rate of reproduction for biological resources in the North.[4]

Northern and especially arctic indigenous peoples have never been numerous communities, but they have always tried to exploit large areas of land. Understanding the patterns of the nature in the North, indigenous peoples avoided setting up large settlements, especially on soft soils. Even in places with a high level of biodiversity and productivity, they settled and moved as separate, small groups, keeping some distance from each other and intuitively trying to reduce the pressure on the soil and the vegetation.

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[1] International Expert Group Meeting. 2010. *Indigenous Peoples: Development with Culture and Identity Articles 3 and 32 of the United Nations Declaration on the Rights of Indigenous Peoples.* New York, UN.

[2] Bogoslovskaya, L. et al. 2013-2017. Indigenous Peoples of the North: Traditional Culture and Knowledge for the Environment. In: Knyazeva, S. (ed.) *Climate Change Adaptation: Traditional Knowledge of Indigenous Peoples Inhabiting the Arctic and Far North.* UNESCO Institute for Information Technologies in Education, p. 8.

[3] Ibid, p. 6.

[4] Ibid, p. 9.

The systems for pasture rotation, carrying capacity of reindeer pastures and projections for pasture productivity: these systems existed among all reindeer herding communities and were strictly regulated in order to avoid overgrazing and the spread of diseases among domestic reindeer. The best reindeer moss areas were considered to be very valuable for the community and during normal weather conditions were not used. In cases of impenetrable ice cover, droughts, and fires reindeer herders would allow their neighbors (other ethnic groups) to temporarily pasture herds on grazing lands belonging to them.[1]

Photo 16. The Arctic reindeer. Taken by Sofia Antal, University of Tyumen

Indigenous peoples are also acutely aware of the relationship between the environmental impacts of various types of development on their lands, and the environmental and subsequent health impacts on their peoples. Through their deep understanding of and connection with the land, indigenous communities have managed their environments sustainably for generations. In turn, the flora, fauna and other resources available on indigenous lands and territories have provided them with their livelihoods and have nurtured their communities.[2]

[1] Bogoslovskaya, L. et al. 2013-2017. Indigenous Peoples of the North: Traditional Culture and Knowledge for the Environment. In: Knyazeva, S. (ed.) *Climate Change Adaptation: Traditional Knowledge of Indigenous Peoples Inhabiting the Arctic and Far North.* UNESCO Institute for Information Technologies in Education, p. 11.

[2] Indigenous Peoples – Lands, Territories and Natural Resources. United Nations. http://www.un.org/esa/socdev/unpfii/documents/6_session_factsheet1.pdf (accessed 10 April 2017).

Keeping these peculiarities in mind, in recent decades, many countries have reformed their constitutional and legal systems in response to calls from indigenous movements for legal recognition of their right to the protection and control of their lands, territories and natural resources.[1]

§ 4. INTERNATIONAL AND DOMESTIC REGULATIONS OF INDIGENOUS LAND USE

International level

One of the key goals of sustainable development is to secure the survival of indigenous peoples. This target is emphasized in many international documents, including the UN Declaration on the Rights of Indigenous Peoples (2008)[2], Convention concerning Indigenous and Tribal Peoples in Independent Countries (1989, No. 169)[3], the UNESCO Universal Declaration on Cultural Diversity (2001)[4], and others.

Some international documents pay special attention to the relationship between the natural environment, sustainable development and the cultural, social, economic development of indigenous peoples. For example, Agenda 21 requires states to promote the role and participation of indigenous peoples and local communities in land issues.[5] The involvement of indigenous people and their communities at the national and local levels in resource management and conservation strategies is suggested in other relevant programs of Agenda 21.[6] Some international acts underline special conditions of traditional way of life of indigenous peoples. For example, the Convention on Biological Diversity in its Article 8 states that each party shall "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological

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[1] Indigenous Peoples – Lands, Territories and Natural Resources. United Nations. http://www.un.org/esa/socdev/unpfii/documents/6_session_factsheet1.pdf (accessed 10 April 2017).

[2] United Nations Declaration on the Rights of Indigenous Peoples. 2008. United Nations. http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf (accessed 5 April 2017).

[3] Convention concerning Indigenous and Tribal Peoples in Independent Countries. 1989. C169 – Indigenous and Tribal Peoples Convention, 1989 (No. 169) International Labor Organization official website. http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169 (accessed 5 April 2017).

[4] UNESCO Universal Declaration on Cultural Diversity. 2001. United Nations Educational, Scientific and Cultural Organization official website. http://portal.unesco.org/en/ev.php-URL_ID=13179&URL_DO=DO_TOPIC&URL_SECTION=201.html (accessed 5 April 2017).

[5] Agenda 21. 1992, art. 26.3. United Nations Conference on Environment and Development, June 3-14, Rio de Janerio, Brazil. http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf (accessed 5 April 2017).

[6] Agenda 21. 1992. United Nations Conference on Environment and Development, June 3-14, Rio de Janerio, Brazil. http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf (accessed 5 April 2017).

diversity"[1]. The most important right declared by international acts is the right to possess and use lands and natural resources for traditional occupations and way of life.

Some Arctic states have ratified Convention No. 169 and signed the Declaration on the Rights of Indigenous Peoples (Norway, Denmark)[2]. Although not every nation-state has adopted laws regulating land rights and land-use planning related to indigenous territories, they include appropriate norms into basic environmental and land-use legislation. For example, in the United States, indigenous peoples may use the National Environmental Policy Act (NEPA)[3] to submit comments to the relevant federal agency and then ensure that the agency at least considers the community's concern. In this manner, American indigenous communities can ensure that they have an opportunity to comment on projects that could potentially contribute to increased greenhouse gas emissions and, as a result, climate change[4].

The Russian Federation has not ratified the Convention No. 169 and has not signed the Declaration on the Rights of Indigenous Peoples yet. Formally, Russia has no legally binding obligation to implement the indigenous rights into its national legislation. Nevertheless, indigenous peoples in Russia has gained constitutional and legislative support: the Russian Constitution guarantees the rights of indigenous peoples "in accordance with generally recognized principles and norms of international law"[5], and shares the responsibility between federal and regional governments for "the protection of traditional living habitat and of traditional way of life of small ethnic communities"[6].

Federal level

Under Article 72 of the Constitution the Federal Government has responsibility and jurisdiction to regulate and protect the rights of indigenous peoples, and the regions of the Russian Federation must bring their laws into conformity with federal legal framework[7].

The Concept for the Sustainable Development of Indigenous Peoples of the North, Siberia and the Far East of the Russian Federation is the key document determining the main principles of Russian national policy towards the indigenous peoples of the North. The main objective of the policy is to strengthen their social and economic potential, to

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[1] Convention on Biological Diversity. 1992. The CDD website. https://www.cbd.int/doc/publications/CBD-10th-anniversary.pd (accessed 10 March 2017).

[2] Convention concerning Indigenous and Tribal Peoples in Independent Countries. 1989. C169 – Indigenous and Tribal Peoples Convention, 1989 (No. 169) International Labor Organization official website. http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C169 (accessed 5 April 2017).

[3] 42 U.S.C. §§ 4321-4370, 2010.

[4] Abate, R. S. and Kronk, E. A. (eds.). 2013. *Climate Change and Indigenous Peoples: The Search for Legal Remedies.* Cheltenham and Northampton: Edward Elgar Publishing.

[5] Constitution of the Russian Federation. 2014. *SZ RF* 31: 4398, art. 69. Also available online at. http://www.constitution.ru/en/10003000-04.htm (accessed 10 February 2017).

[6] Ibid, art. 72.

[7] Ibid.

protect the traditional environment, traditional lifestyle and cultural values with governmental support as well as through mobilization of their internal resources.[1] As one of the principles it states the participation of indigenous peoples and their representatives and associations in making decisions when natural resources are explored and used in traditional habitats and the areas of traditional economic activities. Unfortunately, the Concept does not suggest any legal mechanisms to guarantee the indigenous rights to lands.

An early federal step, the Presidential Decree No. 397 of 1992, urged the Russian regions to map "territories of traditional use" which would not be available for industrial activities without the consent of the indigenous people.[2] Many regional governments stayed reluctant to implementation of this and other related initiatives. More recently, the federal government has passed a number of special laws to supplement the mechanism of "territories of traditional use".

Federal legislation implementing the constitutional and presidential provisions about indigenous peoples consists of the Federal Law "Guarantees of Rights of Indigenous Peoples in the Russian Federation" (1999)[3], the Federal Law "Territories of Traditional Resource Use" (2001)[4] and some rules and regulations in the specific laws such as the Land Code (2001)[5], the Water Code (2006)[6] and the Forest Code (2006).[7] The Land Code of the Russian Federation confirms the right of indigenous peoples to use agricultural land "in order to preserve and develop their traditional way of life, economics, management and crafts".[8]

For example, the Federal Law "On Guarantees of Rights of Indigenous Peoples in the Russian Federation" sets the right of indigenous peoples, associations of indigenous peoples to gratuitous use of lands referred to different categories and common minerals

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[1] Rasporyazhenie Pravitelstva RF [Order of the Government of the Russian Federation] No. 132-p. 2009. The Concept for the Sustainable Development of Indigenous Peoples of the North, Siberia and the Far East of the Russian Federation. *SZ RF* 7: 876.

[2] Ukaz Presidenta RF [Decree of the President of the Russian Federation] No. 397. 1992. On Urgent Measures to Protect the Places of Residence and Economic Activities of Indigenous Peoples of the North. https://www.kremlin.ru/acts/bank/1216 (accessed 20 March 2017).

[3] Federalnyi Zakon [Federal Law] No. 82-FZ. 1999. 'O Garantiyah Prav Korennyh Malochislennyh Narodov Rossiskoi Federatsii' [Guarantees of Rights of Indigenous Peoples in the Russian Federation]. *SZ RF* 18: 2208.

[4] Federalnyi Zakon [Federal Law] No. 82-FZ. 1999. 'O Territoriyah Tradicionnogo Prirodopolzovaniya' [Territories of Traditional Resource Use]. *SZ RF* 20: 1972.

[5] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147.

[6] Vodnyi Kodeks Rossiiskoi Federatsii [Water Code of the Russian Federation] No. 74-FZ. 2006. *SZ RF* 23: 2381.

[7] Lesnoi Kodeks Rossiiskoi Federatsii [Forest Code of the Russian Federation] No. 200-FZ. 2006. *SZ RF* 50: 5278.

[8] Zemelnyi Kodeks Rossiiskoi Federatsii [Land Code of the Russian Federation] No. 136-FZ. 2001. *SZ RF* 44: 4147, art. 68, 78, 82.

in order to maintain their traditional occupations and way of life; the procedure of land granting is regulated by the federal and regional legislation.[1] The Forest Code of the Russian Federation provides for the right of indigenous peoples of the North, Siberia and Far East of Russia to harvest timber for their own needs on the territories of their traditional habitat and occupations.[2] The Water Code of the Russian Federation regulates the use of water objects by indigenous peoples on their traditional territories.[3] The Federal Law "On Production Sharing Agreements" establishes that in the case of developing deposits located on the traditional territories the main condition of the tender should be the compensation for indigenous peoples whose traditional land is used.[4]

The main federal law regulating aboriginal land rights is "On Territories of Traditional Natural Resource Use". According to Article 10 of this act land plots and waters are granted to indigenous peoples within the special territories to be used for traditional occupations. Article 11 of the same act sets the legal regime of traditional territories and refers to other federal laws that regulate the land rights and resource-related rights. However, the law doesn't set the conditions under which land rights are provided and protected because this is the scope of the land legislation which, in turn, doesn't provide for special legal mechanisms. In Russian system of "land categories" the lands used by indigenous peoples at the same time may be used by oil and gas industry, agriculture industry, landowners. The oil and gas industry and indigenous peoples have been increasingly coming into contact with each other over the past few decades as the search for new oil and gas resources has engendered more exploration and development in lands that indigenous peoples traditionally occupy or customarily use.[5]

Article 97 of the Land Code of Russia reads that special territories of traditional resource use can be organized in the areas of native settlements and traditional occupations of indigenous peoples. The procedure of organization of such a territory, establishing its borders and legal regime is regulated by the Government of the Russian Federation.

In 2009, the Russian Government passed the special lists – the List of Traditional Habitats and Areas of Traditional Occupations of Indigenous Peoples of the Russian Federation, as well as the List of Traditional Occupations of Indigenous Peoples of the Russian Federation.[6] Such lists were set to resolve the problem of confirmation of ethnicity by indigenous peoples of the North in order to receive priority rights to use land, forest, water and other resources. According to these lists a specially protected

[1] *SZ RF.* 1999. 18: 2208.

[2] Ibid. 2006. 50: 5278.

[3] Ibid. 23: 2381.

[4] Ibid.1996. 1: 18.

[5] Indigenous Peoples and the Oil and Gas Industry Context, issues and emerging good practice. 2011. IPIECA, p. 3.

[6] Governmental Order No. 631-p. 2009. *SZ RF* 20: 2493.

areas can be created where any "non-traditional" activities are restricted or prohibited. Unfortunately, by 2017 such areas have not been settled in most Russian regions.

Regional level

The regional governments in Russia take much effort to establish long-term political stability and personal continuity alongside with social programs for indigenous peoples. The example of the Yamalo-Nenets Autonomous District shows a certain progress of regulations guarantying indigenous interests in hydrocarbon development. The Charter of the Yamalo-Nenets Autonomous District[1] declares the rights of indigenous peoples, guarantees their right to traditional lifestyle and occupations, language, culture, etc., the right to participate in the work of regional authorities, local governments according to their national traditions and customs. Public authorities are obliged to take into account indigenous peoples' opinion when dealing with issues that affect their interests.[2] Several laws are related to the problems of land use, traditional nature management, and conservation of natural resources on the lands of indigenous peoples. These are:

1. The Law "On Specially Preserved Areas of the Yamalo-Nenets Autonomous District"[3], which regulates the organization, preservation, and use of specially preserved natural areas of particular scientific, cultural, esthetic, or recreational value, and guarantees protection of the legal rights and interests of the northern indigenous peoples, as well as preservation and development of their traditional lifestyle and occupations.
2. The Law "On Protection of the Natural Habitat and Traditional Lifestyle of the Northern Indigenous Peoples in Yamalo-Nenets Autonomous District"[4] is targeting to preservation of traditional territories and occupations of indigenous peoples, support traditional way of life, to providing facilities and conditions for revival of indigenous culture. Article 8 of the law regulates participation of indigenous peoples in protection of territories by their representatives. The protection instruments are implemented jointly by state authorities, local government bodies, companies, and aiming at economic, social, environmental, organizational, legal and other objectives in order to preserve territories which indigenous peoples traditionally occupy.
3. The Law "On Reindeer Herding"[5] determines legislative, economic, environmental and social fundamentals of reindeer husbandry as one of the most important livelihoods of indigenous peoples.

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[1] Charter of the Yamalo-Nenets Autonomous Area. 1998. No. 56-ZAO. *Krasnyi Sever* 44/1: 22.

[2] Ibid, art. 12.

[3] Law of the Yamalo-Nenets Autonomous District No. 69-ZAO 'On Specially Preserved Areas of the Yamalo-Nenets Autonomous District'. 2004. *Krasnyi Sever* 58.

[4] Law of the Yamalo-Nenets Autonomous District No. 49-ZAO 'On Protection of the Natural Habitat and Traditional Lifestyle of the Northern Indigenous Peoples in Yamalo-Nenets Autonomous District'. 2006. *Krasnyi Sever* 119/1.

[5] Law of the Yamalo-Nenets Autonomous District No. 46-ZAO 'On Reindeer Herding'. 1998. *Vedomosty Gosudarstvennoi Dumy Yamalo-Nenets Autonomous District*, October 8, 1998.

Photo 17. Nomadic settlements. Taken by Vladimir Dushin

The Law "On State Support to Indigenous Peoples, to their Communities and the Northern Organizations Involved in Traditional Occupations in the Territory of the Yamalo-Nenets Autonomous District"[1] requires that in cases where industrial development takes place on the territory of indigenous peoples, the public authorities must inform indigenous peoples about it and organize consultations with their representatives and communities, also public authorities provide for making legal agreements between indigenous peoples and industrial companies, especially those which develop mineral and energy resources.[2] The law also grants indigenous communities the right to participate in development of special regional programs and in control over their enforcement.[3]

[1] Law of the Yamalo-Nenets Autonomous District No. 114-ZAO 'On State Support to Indigenous Peoples, to their Communities and the Northern Organizations Involved in Traditional Occupations in the Territory of Yamalo-Nenets Autonomous District'. 2005. *Vedomosti Gosudarstvennoi Dumy Yamalo-Nenets Autonomous District* 11/2, December, 2005.

[2] Ibid, art. 5.

[3] Ibid, art. 7.

CHAPTER 8
SCENARIO DEVELOPMENT TO EXPLORE THE FUTURE OF LAND USE IN THE ARCTIC REGION

It is this diversity of economic, social and environmental changes that shapes the context for sustainable land management in the Russian Arctic. A broad range of developments and uncertainties appears to call for two divergent approaches. On the one hand, an integration of the various changes and uncertainties can be desirable in order to grasp the entirety of potential implications for the environment and society. On the other hand, disaggregation of particular drivers and effects is required to understand the possible consequences of current trends and the actors' decisions. Turning to a scenario technique helps to combine these approaches in order to show how particular human actions can lead to specific land-use outcomes as well as to demonstrate alternative land-use pathways.

§ 1. WHAT IS SCENARIO PLANNING?

The scenario method describes the basic assumptions and process model, how the future is to be captured in the scenarios, and the method through which the scenarios are formed, including the recommended support systems, modeling techniques, and data sources.[1] Scenarios are plausible descriptions of how the future might develop, based on a set of assumptions.[2]

[1] IGI Global. Disseminator of Knowledge. http://www.igi-global.com/dictionary/scenario-method-scenario-methodology/25822 (accessed 5 April 2017).

[2] Climate Change 2007: Synthesis Report. 2007. Pachauri, R. K. and Reisinger, A. (eds.) IPCC, Geneva, Switzerland.

"Among the many tools a manager can use for strategic planning, scenario planning stands out for its ability to capture a whole range of possibilities in rich detail. By identifying basic trends and uncertainties, a manager can construct a series of scenarios that will help to compensate for the usual errors in decision making – overconfidence and tunnel vision"[1], – ***Paul J. H. Schoemaker** is the chairman of Decision Stratigies International Inc., and a professor in the Department of operations and information management, the Wharton School, University of Pennsylvania.*

Box 10. Scenario planning

Each scenario aims to challenge the reader to visualize and open up for alternative possible futures. Accordingly, none aspires to predict the "true" future nor describe one "best" or "worst" case. The goal is to illustrate how different combinations of developments in the various driving forces provide a spectrum of potential futures. Taking widely different possible outcomes into account helps stakeholders prepare more robustly for multiple opportunities, as well as the challenges and risks that accompany them[1]. Scenarios that are relevant to the Arctic can be used to identify the main opportunities and challenges ahead and to inspire the Arctic community to coordinate preparations for the future.

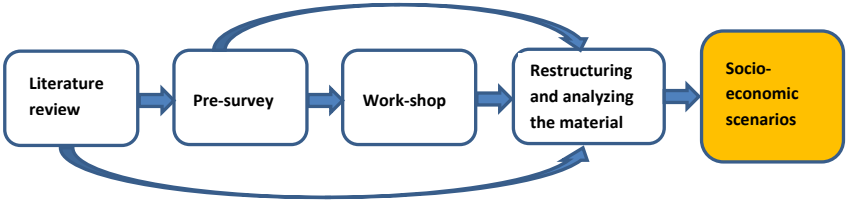

Figure 20. Scenario planning process

The scenario methodology includes workshops and in-depth interviews with sectoral leaders and experts. For example, it can be identified what driving forces will shape the future of the Arctic as an arena for extractive land use and industrial activities – and what the potential implications of these driving forces are.[2] The scenarios are based on a literature review, pre-survey, expert workshop and restructuring and analysis of all materials.

[1] Loe, J. S. P., Fjærtoft, D. B., Swanson, Ph. and Jakobsen, E. W. 2014. *Arctic Business Scenarios 2020: Oil in Demand. Green Transformation. Re-Freeze.* Arctic Institute and DNV GL.

[2] Ibid.

§ 2. THE FUTURE OF THE ARCTIC

The expected rapid environmental changes and potential geopolitical and economic significance have encouraged many authors and organizations to anticipate, predict or analyze the trends and future development of the Arctic region. Some concentrate on the key shaping forces while others go further into constructing conditional scenarios for the area as a whole or for certain activities. One exercise identifying the key trends in the area is the **Megatrends report** published by the Nordic Council of Ministers.[1] It draws attention to the megatrends that shape the changes in the Arctic, but it also goes further in discussing the wishes and priorities of Arctic societies and secure development. The report presents nine overarching megatrends affecting all development in the Arctic:

1. ***Increased urbanisation*** – a global trend also including the Arctic.
2. ***Demographic challenges*** – the old stay while the young leave.
3. ***Continued dependency on transfers*** and the ***exploitation of natural resources*** will continue to dominate the Arctic economies.
4. Continued ***pollution*** and ongoing ***climate change*** will have a significant impact on the nature and environment of the Arctic.
5. Need to generate more ***Human Capital*** by investing more in its people.
6. Changes in the nature of interaction between ***the public and private*** spheres will impact development.
7. ***Renewable energy*** will contribute to a 'greening' of the economy.
8. ***Increased accessibility*** provide opportunities as well as new risks.
9. The Arctic as a ***new player*** in the global game.[2]

An excellent example for scenario development is provided in the "**Socio-Economic Scenarios for the Eurasian Arctic by 2040**" worked out by Finnish Meteorological Institute in 2016.[3] Their analysis shows that plenty of potential pressures for major changes in the Eurasian Arctic exist. Environmental changes, political shifts and technological development can all push forward drastic new developments in the region. This emphasizes the need for any decision-maker to be able to respond to very different futures. Therefore, robust decision making, a good eye for weak signals and tipping points, and the ability to prepare for risks and seize opportunities as they emerge is required in the Eurasian Arctic.

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[1] Hansen, K. G., Rasmussen, R. O. et al. 2012. *Megatrends in the Arctic – New Inspiration into Current Policy Strategies.* Nordic Center for Spatial Development, Stocjholm.

[2] Ibid.

[3] Haavisto, R., Pilli-Sihvola, K., Harjanne, A. and Perrels, A. 2016. *Socio-Economic Scenarios for the Eurasian Arctic by 2040.* Finnish Meteorological Institute.

§ 3. GLOBAL SCENARIOS SUGGESTED BY FINNISH METEOROLOGICAL INSTITUTE

Private – Open – Dirty: "Wild West". The Arctic area in 2040 is described by a laissez-faire economic development driven by the private sector and economic development is prioritized over social and environmental concerns. This leads to haphazard growth and problems in maintaining infrastructure and basic services (such as health care, education). Land use is uncontrolled and transitions haphazard. Development is in the hands of investors and large/multi-national corporations and Arctic resources are mostly privatized. Common property rights are either non-regulated or based on too loose quotas compared to the environmental carrying capacity, and therefore natural resources (e.g., fish) are overharvested and ecosystems will degrade. Clean technology will lose its competitiveness due to lack of regulative incentives and the development of the Arctic relies on environmentally unsustainable technologies, such as fossil fuels or bottom trawling. There is insufficient or no international regulations and law enforcement to guide exploration and exploitation, which will lead to little investment in safety technologies as it is not required by rules and regulations. Indigenous peoples and their claims are ignored and their subsistence is at risk. Hunting and reindeer herding are close to vanishing.[1]

Private – Open – Clean: "Silicon Valley". Society in 2040 has realized the natural carrying capacity of the Arctic through extensive R&D and communication thereof to society through strong science-policy dialogues. Climate change has progressed as projected and society has had time to adapt to the changes. Awareness raising, education and global environmental awakening have created generally accepted sustainability standards and guidelines that comply with the carrying capacity of Arctic. This gives more power to NGOs and creates sufficient trust between various stake- and rights-holders.

Clean technologies boom and are competitive. Green and clean entrepreneurship dominate the economy and firms compete actively for the best environmental performance. The scientific community is actively involved in product development and innovation. Product certification and rewardfine systems communicate the environmental performance of economic activities and products.

New international organizations and mechanisms emerge to resolve domestic and international conflicts and to monitor activities in the Arctic. However, responsibility in case of accidents and everyday-life events relies on private insurances.

Regardless of good economic and environmental performance, social well-being in many Arctic regions lags behind. Corporations lack social integrity inside the Arctic, which is why social infrastructure is not as developed as other infrastructure and high level welfare and health care services are not universally available. Work-related immigration

[1] Haavisto, R., Pilli-Sihvola, K., Harjanne, A. and Perrels, A. 2016. *Socio-Economic Scenarios for the Eurasian Arctic by 2040.* Finnish Meteorological Institute, pp. 46-47.

to the Arctic creates large differences in the wealth of people, and the economy relies largely on a "fly in fly out" work force.[1]

Public – Open – Dirty: "Exploited Colony". In 2040, the development of the Arctic region is heavily guided by short-term profit seeking behaviour where only immediate benefits count. Public debates are focused on economic issues, resulting in public acceptance to the short-term utilization of Arctic resources. Oil and gas resources are heavily exploited by companies which are largely publicly owned and operate in close guidance and collaboration with the public sector. The companies are seen as important pillars of national economies, yet there are high corruption rates.

Climate change has progressed faster than expected, which incites selfish behaviour among countries and companies. There is no scientific or political agreement on the natural carrying capacity of the Arctic, and the global climate system is thus not considered a constraining factor for Arctic development.

Rules and regulations, including taxes/fines, are too weak to lead to a balanced sustainable development where social and environmental concerns are on equal footing with economic targets. The area is developed at any cost.

The area is exploited with insufficient safety standards due to lacking safety technologies.

Socio-economic inequalities in the area are pronounced and conflicts arise between native people, immigrant workers and public authorities.[2]

Public – Open – Clean: "Shangri La". The Arctic area in 2040 has established a sustainable balance between environmental, social and economic conditions. Natural resources are managed sustainably and there are strong health policies resulting in improved physical and mental health as well as improved well-being of Arctic inhabitants.

Regulation is based on public deliberation, accurate climate and nature's carrying capacity information, and sustainability considerations. All land claim agreements (between the indigenous population and other Arctic citizens) have been settled.

Economic actors have a strong bias for Arctic environmental protection and conservation, which encourages investments in R&D of clean technology. As one result, tourism causes limited stress for the Arctic environment.

Overall, national, regional and international regulation is clear and precise and is practiced from a responsible and equalized viewpoint. Regulation consists of incentive-based policies and license systems, which are a result of awareness raising, public information sharing and exchange delivered by media campaigns.

A global consensus of a conflict-free Arctic prevails and new co-operative Arctic institutions emerge. These institutions possess mechanisms for domestic and international conflict resolution. High trust in compliance is achieved by intergovernmental surveillance and monitoring.

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[1] Haavisto, R., Pilli-Sihvola, K., Harjanne, A. and Perrels, A. 2016. *Socio-Economic Scenarios for the Eurasian Arctic by 2040.* Finnish Meteorological Institute, pp.47-48.

[2] Ibid, pp. 48-49.

Regulated, small-scale aquaculture provides sustainable livelihood to local communities.[1]

Closed - Dirty: "Conflict Zone". In 2040, political instability is high and the Arctic is riddled by political conflicts and non-secure conditions. Also global instability prevails because of unbalanced distribution of resources, such as clean water. Conflicts about, for instance, land rights and livelihood activities between states and the native people occur. Arctic countries have permanent and large-scale military presence in the area and military conflicts are taking place.

International and Pan-Arctic organizations have no mandate in regulating the area and Arctic states lack sufficient enforcement capability.

Environmental and other safety issues are considered secondary to national security, which leads to high risk operations and several environmental disasters taking place.

The uncertain and unstable conditions together with the lack of infrastructure hinder long term private investments.[2]

Closed – Clean: "Antarctic". In 2040, an international Arctic Treaty is adopted supported by strong global climate policy. The international community decides that uncertainty and risks related to the impacts of Arctic resource exploitation on climate change and environmental degradation are too high, and it is safer to turn the Arctic into a sanctuary.

The global economy is decarbonized and renewable resources are politically fostered.

Based on the treaty, the Arctic area is regulated so that there is loss of extractive economic interest resulting in a cleaner environment. Some small-scale economic activities are sustained; such as limited eco- and scientific tourism. Stakeholders and rights holders are committed to preserving natural habitats with instruments such as land trusts. The few private tourism companies concentrate on minimizing their environmental impact. The companies fear loss of reputation.

Indigenous peoples gain strong land rights and strong constituencies. Also other residents enjoy stable, yet economically less developed living conditions. Any infrastructure is ran by de-centralized renewable energy.

Heavy regulation limits activities in the Arctic, which in turn decreases demand for new technological solutions. Thus, innovations in Arctic technology are slow.

Scientific, exclusive, (self-)regulated tourism to the unique areas (North Pole, Northern Sea Route) takes place.[3]

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[1] Haavisto, R., Pilli-Sihvola, K., Harjanne, A. and Perrels, A. 2016. *Socio-Economic Scenarios for the Eurasian Arctic by 2040.* Finnish Meteorological Institute, p. 49.

[2] Ibid, p. 50.

[3] Ibid.

Table 7

Interpretation of the narratives

	"Wild West"	**"Silicon Valley"**	**"Exploited Colony"**	**"Shangri La"**	**"Conflict Zone"**	**"Antarctic"**
Framing uncertainties	Private – open dirty	Private – open clean	Public – open dirty	Public – open clean	Closed – dirty	Closed – clean
Resource extraction	Low hanging fruits	Efficient; Respects carrying capacity	Inefficient, old technology	Regulated; Sustainable technologies	Causes conflicts	None
Tourism	Popular destination	Responsible tourism	Difficult access	Responsible tourism	None	Exclusive
Land use	Uncontrolled, resources are mostly privatized	Sustainable and scientifically approved	Heavily exploited	Managed sustainably	Conflicts about lands and land rights	Sanctuary, preserved lands; Indigenous peoples gain strong land rights
Regulations	Insufficient international regulations and little domestic compliance or none	Soft rules and compliance; sustainability standards and guidelines	Rules and regulations are weak	Clear and precise; Incentive-based policies and license systems	No mandate in regulating use and protection	Hard law treaty on non-use and protection

§ 4. NATIONAL SCENARIOS

National scenarios can be based on regulatory documents and reports issued in Russia, first of all on the Development Strategy of the Arctic Zone of the Russian Federation. The **Development Strategy of the Arctic Zone of the Russian Federation and National Security for the Period up to 2020**[1] defines the basic mechanisms, ways and means to achieve the strategic goals and priorities for the sustainable development of the Arctic. The document depicts a complex and integrated picture of Russia's security situation. It describes current world trends and defines Russia's national interests and strategic priorities, key factors influencing the socio-economic development of the Russian Arctic (extreme climate conditions, high distance from industrial centers, etc.).

[1] The Foundations of Russian Federation Policy in the Arctic until 2020 and Beyond. The Strategy of the Arctic Zone Development and National Security of the Russian Federation and for the Period until 2020. 2009. http://www.government.ru (accessed 20 February 2017).

The main drivers of the Arctic development in the strategy are the sovereignty, national interests and public authorities' efforts. The document discusses risks and threats of the current situation of the Russian Arctic development (negative demographic trends, development of the basic infrastructure, imbalance in economic development, etc.).

The main national interests of the Russian Federation in the Arctic are:

— the use of the Arctic Zone as a strategic resource base of the Russian Federation, providing solutions to the task of socio-economic development of the country;
— preservation of the Arctic as an area of peace and cooperation;
— conservation of the unique Arctic ecosystems;
— use of the Northern Sea Route as a national unified transportation line of the Russian Federation in the Arctic.

Development priorities and key activities in the Russian Arctic:

— socio-economic development (improvements of governance, the quality of indigenous people's life, natural resource base);
— development of science and technology (scientific research programs, new technologies in the field of environmental management, long term prospects);
— creation of a modern information and telecommunications infrastructure (communications centers, multi-purpose space system "Arctic");
— environmental security (development of the Arctic protected areas, clean up programs combating the previous contamination);
— international cooperation in the Arctic (beneficial multilateral and bilateral cooperation, promotion of transit routes);
— ensuring military security, defense and protection of the state border of the Russian Federation in the Arctic.[1]

The Strategy identifies threats and challenges within broad concepts defined as:

1) National defense;
2) State security and civil protection;
3) Improvement of living standards;
4) Economic growth;
5) Research, technologies and education;
6) Healthcare;
7) Culture;
8) Ecology;
9) Strategic stability and partnership on equal terms.

Based on these key assumptions, priorities and concepts scenarios of the national Arctic territories can be developed.

[1] The Foundations of Russian Federation Policy in the Arctic until 2020 and Beyond. The Strategy of the Arctic Zone Development and National Security of the Russian Federation and for the Period until 2020. 2009. http://www.government.ru (accessed 20 February 2017).

§ 5. SCENARIOS OF REGIONAL DEVELOPMENT – YAMALO-NENETS AUTONOMOUS DISTRICT

The Yamalo-Nenets Autonomous District is one of the largest constituents ("subject") of the Russian Federation, a dynamically developing region. The administrative center is Salekhard, the city located on the Arctic Circle. The Yamalo-Nenets Autonomous District consists of 58 municipalities, six of which are urban districts, seven municipal districts, urban areas and 38 rural villages. This region is the homeland of the largest remaining nomadic pastoralist group active in the Arctic – the Yamal Nenets.[1]

The Yamalo-Nenets Autonomous District is located in the Arctic zone of the West Siberian Plain, in the center of Russia's Far North. It has an area of 769 250 square kilometers, that is several times as much as an average West-European country.[2]

The climate is continental, determined by the presence of permafrost, proximity of the Arctic Ocean and abundance of bays, rivers, lakes and swamps. The district is featured with long (up to 8 months) winter and short (50 days in average) summer, strong winds and low snow depth. An average annual temperature of air is –10°C. The minimum winter temperature is down to –57°C, in summer July temperature can increase up to +30°C throughout the area, however, the soil thaws out only for 40-50 centimeters. There are frequent magnetic storms, which are accompanied by the northern lights.[3]

The district is washed by the Kara Sea and includes the Yamal, Taz and Gyda Peninsulas and Beliy, Oleniy and Shokalsky Islands, etc. The main rivers are the Ob, Taz, Pur, Nadym, Yurybey, Messoyakha, etc. There are many lakes in the district.[4]

Tundra and forest tundra occupy three-fifths of the district; sphagnum bogs are widespread. Forests of Siberian larch, spruce, and nut pine occur in the south, primarily along river banks.[5]

In 2017, the district population amounted to almost 540 thousand people. The population density is 0,7 people per one square kilometer, urban population relative to total population – 85,0 %.[6] Yamalo-Nenets Autonomous District is one of the most multi-ethnic

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[1] Yamal-Nenets autonomous district. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[2] Ibid, p. 3.

[3] Yamal-Nenets autonomous district. Description. http://interyamal.ru/system/ckeditor_assets/attachments/364/passport-eng.pdf (accessed 20 March 2017).

[4] Yamal-Nenets autonomous district. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[5] Ibid, p. 3.

[6] Население Ямало-Ненецкого автономного округа 2015: численность, крупные города [Population of the Yamalo-Nenets Autonomous District 2015: amount, big cities]. 2015. Statdata.ru. http://www.statdata.ru/naselenie/naselenie-yanao (accessed 5 April 2017).

regions of the Russian Federation. Representatives of 112 ethnic groups and nationalities live in the district. Over 40 thousand people living there are representatives of indigenous peoples of the North. The share of the Nenets in the structure of the population is 5,7 %, the Khanty is 1,8 %, the Selkup is 0,4 %. More than 15 thousand of indigenous peoples live a nomadic way of life.[1]

Yamal plays a strategic role in Russia's gas production being an outpost for the future movement onto the Arctic shelf. The development of Yamal resources is the biggest energy project in the newest Russian history. The most important strategic infrastructural projects in the energy sector, the implementation of which has already begun or is envisaged in the near future, include the development of a port and transport infrastructure for the transport of liquid hydrocarbons, the construction of a gas transmission system from the Yamal Peninsula.[2]

Unique location of Yamal gives the opportunity to develop a logistic model of year-round liquefied natural gas (LNG) supply to markets in Europe, North America and Asia-Pacific Region via the Northern Sea Route.[3]

In the longer term, the district will be the basis of Russia's Energy Strategy.[4] Therefore, currently, there is active development and implementation of industrial investment projects, significant in terms of their scale, investments and costs in the district.

Table 8

Dynamics of Gas Production in the Yamal Peninsula (forecast)[5]

Year	2015	2020	2025	2030
Gas production, billion cubic meters	75-115	135-175	200-250	310-360

Reindeer herding and fishing are traditional for the agrobusiness of the region. In 2015, the Yamal's domestic reindeer population amounted to 678 thousand heads, 360 thousand of which are in farm households. It is the largest domestic reindeer herd in the world.[6]

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[1] Yamal-Nenets autonomous district. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[2] Ibid, p. 10.

[3] Kobylkin, D. 2012. Yamal is the most important link in the Russian national freight and logistics strategy. ArcticInfo News Agency. http://www.arctic-info.com/opinions/interviews/25-10-2012/transportnaa-logistika-na-amale (accessed 10 April 2017).

[4] Yamal-Nenets autonomous district. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[5] Ibid, p. 11.

[6] Агропромышленный комплекс Ямала [Agrobusiness of Yamal]. Department of agro-industrial complex, trade and food of Yamalo-Nenets Autonomous District official website. http://yamalagro.ru (accessed 30 March 2017).

The Yamal tourism infrastructure has 1 115 entities of tourist industry and tourist resources. The District's priorities in research: history, archaeology and ethnology, geopolitics and economics, ecology and biomedicine, study of the resource potential of the district.[1]

The **Strategy of Socio-Economic Development in the Yamalo-Nenets Autonomous District until 2020**[2] gives impression of how the regional authorities envisioned the future.

The priority strategic goals of social and economic development of the Autonomous District are:

— modernization of infrastructure and social sectors;
— economic development;
— human development and preservation of traditions;
— environmental protection;
— autonomous district is an international outpost for the Arctic development.[3]

Drivers of the regional development

Political. In terms of geopolitics the Yamalo-Nenets Autonomous District is a strategic region of Russia in Arctic latitudes. Yamal became the unique place for international and circumpolar cooperation. It is proved by the fact that for last years the image of the district has grown considerably on the international arena.[4] The effective exchange of knowledge and progressive experience in management and development of northern territories make a considerable contribution in sustainability of Yamal.[5]

Today Yamal is a competent and active participant of international organisations, initiator and co-organisator of many international projects and programs. For last years the Yamalo-Nenets Autonomous District has built tight and long-term relations with the largest organisations such as UN, Arctic Council and International Nobel Fraternity Fund.[6]

In the past decades, the Yamalo-Nenets Autonomous District has become one of the leading Russia's regions. As the strategic Arctic resources are mostly located in the territories of the Yamalo-Nenets Autonomous District, it has been transformed from a raw-material province to strategic entity of the Russian Federation and gained recognition both in Russia and far beyond.

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[1] Yamal-Nenets autonomous district, p. 24. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[2] Postanovlenie on December, 14 2011 No. 839 [Decree of 14 December 2011 No. 839].

[3] Ibid.

[4] Yamal-Nenets autonomous district, p. 14. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[5] Ibid.

[6] Ibid.

Economic. Yamal means long-term perspectives of social and economic development of the region, directed to the welfare of the territory and all Russia. The Yamalo-Nenets Autonomous District is reliable base of Russian economy.

The district is one of the five regions of Russia with the highest index of the investment rating. The main economic activities of the district are industry, construction, trade, transport and communications, agriculture and forestry. Today, 17 companies implement 43 investment projects on the territory of the autonomous district with the total cost of investments more 1,96 trillion rubles.[1]

Being the main Russia's gas bridgehead, the Yamalo-Nenets Autonomous District will remain the center of national and world gas production in the 21st century. Yamal accounts for 85 % of Russia's and 20 % of the world's natural gas production. During the entire time of mining development, over 15 trillion cubic meters of natural gas (about 12 % the total district resources) have been extracted. 235 hydrocarbon deposits have been discovered in the district, 63 of which are being commercially operated, 22 have been prepared for operation, and geological exploration is being carried out at 150 deposits.[2]

Social. The population projections in the Yamalo-Nenets District vary. The societal development is to large extent driven by interlinked drivers of migration both into and out of the area. Now the population of the Yamalo-Nenets Autonomous District can be subdivided by its ethnocultural, social, and economic characteristics into three main groups: 1) the indigenous or aboriginal peoples – the Nenets and Khanty as well as representatives of other northern peoples including the Selkup, Mansi, and others; 2) non-indigenous, mostly Russian-speakers (newcomers) many of whom were born in the region as well as the new permanent residents living in the population centers; and 3) temporary, non-permanent residents such as duty-shift workers.[3]

Despite the rather small population, demography is one key issue in societal development. Ageing of the population, on the one hand, and the decreasing youth, on the other hand, are important factors for the development of Arctic communities in Yamal. Urbanization is a global megatrend that is also seen in the region. Especially the young migrate from the region due to, for example, the lack of education opportunities but the old remain.[4]

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[1] Strategy of Socio-Economic Development in the Yamalo-Nenets Autonomous District until 2020. Postanovlenie on December, 14 2011 No. 839 [Decree of 14 December 2011 No. 839].

[2] Yamal-Nenets autonomous district, p. 9. http://kauppakamari.fi/.../Yamalo-Nenets-autonomous-district.pdf (accessed 5 April 2017).

[3] Pika, A. and Bogoyavlensky, D. Yamal Peninsula: Oil and Gas Development and Problems of Demography and Health among Indigenous Populations. http://arcticcircle.uconn.edu/SEEJ/Yamal/pika3.html (accessed 5 April 2017).

[4] Hansen, K. G., Rasmussen, R. O. et al. 2012. *Megatrends in the Arctic – New Inspiration into Current Policy Strategies.* Nordic Center for Spatial Development, Stocjholm.

Technological. Technological advancements in all sectors and scales shape the development. In the region, improved technologies regarding hydrocarbon production, shipping and transportation especially affect the future development of large-scale investment and research projects of the region are aimed at expanding the resource base of the Arctic zone of the Russian Federation and providing the country with hydrocarbon, aquatic biological and other strategic resources. Several on-going projects can be described:

1. **'The Program for the Comprehensive Development of Oil and Gas Fields in the Yamal Peninsula and adjacent offshore areas'.** The Program was commissioned by the Russian President and the Government, and designed jointly by Gazprom company and the Yamalo-Nenets Autonomous District Administration in 2002. According to the Program, the field development process will include the creation of three industrial zones: Bovanenkovo, Tambey, and Yuzhnaya.[1] The estimated investments will be approximately 300 bn rubles.[2]

2. **'Next generation gas pipeline system'** which will be a part of the renovated the United Gas Pipeline System of the Russian Federation. By 2030 unique system will be launched, and it will include 2 500 km of pipelines; 27 booster stations with total power capacity 8 600 to 11 600 MW. The system will be able to carry over 300 bn m^3 of natural gas from Yamal. Only in 2011 the investments were amounted to 424,4 bn rubles.[3]

3. **'The Messoyakha Project'** is extremely important for both the Yamal disctrict and Russia since it provides a framework for the development of Russia's most northern oil and gas onshore fields – the Western Messoyakha and Eastern Messoyakha.[4] Full-scale development of the fields started in 2016, with the expected aggregate investment of 17 to 20 billion USD.[5]

4. **'The Novoportovskoye Field development project'** is one of the top priority Yamal projects of Gazprom Neft company for the next several years. A huge oil and gas condensate field will be developed, and the inlet oil terminal near Cape Kamenny, at 2,5 km from the coast, will be constructed. The investment amount in 2013 was 12 to 15 billion rubles, and total capital investment in the development of the field and the construction of oil transportation system will be 320 billion rubles by 2020. By this date the Novoportovskoye oil and gas condensate field will be producing 5 million to 8 million tons of oil per year, with a total output of 13 million tons of oil equivalent. Oil and gas

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[1] Official web-site of the company Gasprom. http://www.gazprom.ru/about/production/projects/mega-yamal (accessed 8 April 2016).

[2] Ibid.

[3] Ibid.

[4] Official web-site of the company Gasprom. http://www.gazprom-neft.ru/company/business/exploration-andproduction/new-projects/messoyaha (accessed 8 April 2017).

[5] Ibid.

condensate will be transported by tankers with icebreaking support by the Northern Sea Route.[1]

5. **'Yamal Liquid Natural Gas Project (Yamal LNG)'** is the most ambitious project ever in the Russian gas industry, which includes the development of the Yuzhno-Tambeyskoye natural gas condensate field, and the construction of the natural gas liquefaction plant together with the Arctic port Sabetta. For processing and liquefaction process onshore facilities will be built LNG plants with capacity of million tons per year for three process lines; four LNG terminals with capacity of 160 thousand m^3; oil pier with two berths. The first phase launch is planned in 2016, the total amount of investments is estimated at 18 bn USD. For transporting of LNG from the port Sabetta 16 new gas tankers of ice class with 140-160 tons carrying capacity will be used.[2]

Legal. Russia is a federal state and this makes certain implications on the development. The main legal trend in recent years was centralization, especially in subsoil use which was expressed for northerners in the elimination of regional powers and shifting the regulations of oil and gas area to federal authorities. This led to a dramatic reduction of regional and local authorities to oversee both the economy and resources and land use. Oil and gas development is regulated mostly by federal legislation, while land, environmental and industry issues to a certain extent can be regulated by the regional laws and sub-laws. Generally, the scope of regional powers in these spheres is very limited. According to the federal legislation regions can have legal initiatives on such matters as monitoring, preservation of endangered species, targeted programs. For example, the law "On Environmental Protection in the Yamalo-Nenets Autonomous District" distributes the powers between the regional and municipal authorities, regulates economic initiatives on environmental projects and sets some rules on environmental monitoring, environmental supervision and preservation of endangered species. The Law "On Subsoil Use in Yamalo-Nenets Autonomous District"[3] aims to regulate the use of common minerals which is under the regional jurisdiction. No article in the law deals with environmental protection of the subsoil and minerals.

The following programs have been recently developed and implemented in the region:

1) Health Development;
2) Development of education;
3) Social support of citizens and labor protection;
4) Providing affordable and comfortable housing for the population;
5) Energy Efficiency and Energy Development;

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[1] Investment Projects in Yamal. http://www.yamaloilandgas.com/en/yamal-invest (accessed 8 April 2017).

[2] Hydrocarbon-Technology.com. http://www.hydrocarbons-technology.com/projects/yamal-lng-project-russia (accessed 10 April 2017).

[3] Zakon Yamalo-Nenets Autonomous District 'On Subsoil Use in the Yamalo-Nenets Autonomous District'. 2012. No. 56-ZAO. *Krasnyi Sever* 52, 2012.

6) Promotion of employment;

7) Protection of the population and territories from emergency situations, fire safety and water safety;

8) Cultural development;

9) Environmental protection;

10) Development of tourism and recreation activities for the youth;

11) Development of scientific, research, technical and innovative activities;

12) Economic development and innovative economy;

13) Information technologies for the society;

14) Development of transport infrastructure;

15) Development of international, foreign economic and interregional activities;

16) Development of mineral resources base;

17) Development of forestry.[1]

The most legislative powers the region obtains in the area of indigenous regulations. In general, regional laws offer increased language rights and social preferences to indigenous peoples but the legislators have been reluctant to recognize their land ownership rights. However, international instruments that address the rights of indigenous peoples are continuously being elaborated. Some examples of this type of development are the United Nations Declaration on the Rights of Indigenous Peoples and Convention No. 169.[2]

Several laws of the region are related to the problems of land use, traditional nature management, and conservation of natural resources on the lands of indigenous peoples.

Implementing the legal norms, the regional authorities create good conditions for oil and gas companies to work closely with indigenous peoples in discussion of special requirements and conditions of the industrial projects.

Environmental. The primary responsibility for protecting the environment rests with regional governments. Their essential jobs are to realize rules proposed by the central government in the certain conditions and to facilitate environmentally friendly activities in the North. However, the scope of regional powers in the environmental sphere is very limited.

The regional authorities have very little expertise in providing effective environmental measures as one of their main tasks for the last decades have been to increase oil and gas production but not to protect the natural environment. As they have recently faced immense environmental problems, the region takes its effort for ensuring effective and sustainable natural resource utilization and environmental protection;

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[1] Strategy of Socio-Economic Development in the Yamalo-Nenets Autonomous District until 2020. Postanovlenie on December, 14 2011 No. 839 [Decree of 14 December 2011 No. 839].

[2] Haavisto, R., Pilli-Sihvola, R., Harjanne, A. and Perrels, A. 2016. *Socio-Economic Scenarios for the Eurasian Arctic by 2040.* Finnish Meteorological Institute.

serious work has to be started to create a legislative basis for dealing with environmental impacts.[1]

Despite the effects of climate change on agriculture and substantial land-use change in the Yamal district, no official mechanisms for climate change adaptation or biodiversity conservation have been introduced so far. As the result, protected lands and marine areas of the Russian Arctic are much smaller than in foreign Arctic countries (5,2 percent in Russia compared to 20-50 percent in other Arctic states).[2] Altogether, the environmental dimension, although often mentioned, is barely effectively addressed by the state regulation and governmental programs.

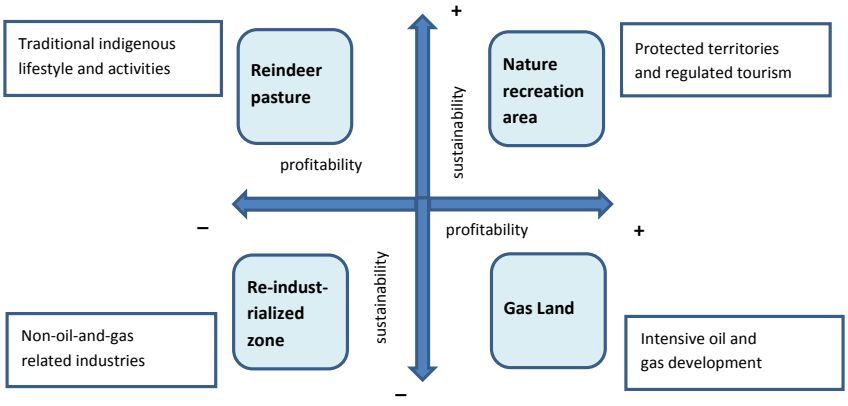

Figure 21. Scenarios of the Yamalo-Nenets Autonomous District development

In recent years there has been an upsurge of Arctic tourism in the region. Russian and foreign tourists are showing growing interest in this northernmost region. It is rich in tourist attractions: vast expanses of tundra and forest-tundra, with an abundance of wildlife; islands featuring polar desert and semi-desert terrain; innumerable mountains, lakes, and streams offering recreational opportunities; the highest ethnic diversity in the Arctic, including indigenous peoples; and historical artifacts and monuments.[3]

We suggest four scenarios of regional development varying from low to high degree of sustainability.

[1] Kharyuchi, S. 2005. 'Legislative Regulation on Yamal's Natural Resources'. *Indigenous Peoples' World – Living Arctic* 17: 119

[2] State Program of the Russian Federation. 2012. 'Environmental Protection in 2012-2020'. *The Government Resolution* 27 December 2012 No. 2552-p.

[3] The Arctic. Tourism and Recreation. http://arctic.ru/tourism (accessed 5 April 2017).

GAS LAND

The Yamalo-Nenets Autonomous District takes off as a country and global petroleum province. Gas industry is booming. Large oil and gas discoveries have been made in the Barents and Kara Seas, followed by large-scale infrastructure development. International actors take part in the exploration, extraction and transport of gas to world markets. Despite political tensions, there is a high level of business cooperation between Russia and foreign partners. Exported gas provides an inflow of billions of dollars into the Russian economics. Revenues and serves are the basis for the operation of power plants, chemical industry, housing and housing services. Revenues are consolidated in federal budget, petroleum activities are regulated by the federal center. It provokes strains between federal and regional authorities. However the main deposits are gradually being developed and the national economy needs new gas resources. There is a high risk of environmental disaster in fragile Arctic ecosystems. The legislation on subsoil use is being elaborated while environmental legislation is in stagnation. The slogan "Gas at any price" which dominated in Yamal half a century ago remains far in the past. The District authorities are strictly observing existing environmental norms and the main priority of oil and gas companies is to use best available technologies.

Indigenous peoples are limited in their access to land resources. Oil and gas companies make efforts to respect the traditional way of life of indigenous peoples – make agreements and compensate their losses. Indigenous peoples who traditionally used their lands for agriculture and reindeer herding have to resettle and look for new occupations. Thus their ties to the environment are broken and cultural identity weakens.

Photo 18. Taken by Radis Sibagatullin

RE-INDUSTRIALIZED ZONE

Negative trends in the global hydro-carbon market and tension between federal center and the region forced the Yamalo-Nenets Autonomous District to look for alternative ways of development. Companies and authorities are encouraged to further action and open new perspectives and possibilities. The infrastructure is used for new industrial projects. Opportunities provided by the "new industrialization" policy are limited by global economic crisis, Western sanctions, dependence of the domestic economy on foreign technological assistance and investments. New large enterprises are created such as, for example, electrometallurgy, oil and gas equipment, construction materials, metal goods. Many traditional industries in the region experience a revival too. In particular, timber harvesting and processing has been developing rapidly. R&D potential is actively growing. There are favorable conditions in the region for the development of hydrocarbon refining enterprises: the proximity of raw material base; electric power plants; engineering, transport, and industrial infrastructure, substantial water resources.

Fisheries coexist with industries, though fisheries are threatened by environmental problems. A strategic environmental assessment is carried out for each project together with an exploratory study of the various stakeholders involved. Indigenous peoples are limited in their access to land resources, though industries get their free and informed consent prior to the approval of every project.

The region is oriented at sustainable land management adjusted to the local biophysical conditions, product differentiation, as well as the search for unexploited market channels and certification. Initiatives for environmental friendly businesses and innovative technologies are explicitly encouraged.

Research and educational facilities together with the professional education system is evolving. Arctic research center has been created.

Photo 19. Taken from the Archives of "Kongor-Khrom", Ltd.

REINDEER PASTURE

Indigenous peoples gain influence in the international arena. The global community's activities spur the Russian Federation to sign and ratify the United Nations Declaration on the Rights of Indigenous Peoples and Convention No. 169. The region legal instruments that address the rights of indigenous peoples are continuously being elaborated. Indigenous land claims are widely supported and indigenous people have an unlimited access to lands and resources. Reindeer herding is actively developed, the state and the region subsidizes the traditional enterprises. The domestic reindeer herd is expanding. Because of excessive amount of reindeer it becomes more difficult to respond to ecological changes and exploit pastures. Pastures are surrounded by industrial installations and non-cleaned remnants of hydrocarbon production across the region. Land reclamation and remediation is needed.

Overgrazing and spread of disease among domestic reindeer occur. Climate change and environmental degradation have an impact on herding which forces indigenous communities to look for stronger state support.

Indigenous peoples have to use alternative ways of their economic development, at the same time they are seeking to balance these emerging opportunities with their traditional lifestyle and values closely connected with the land and wildlife.

Oil and gas industry is shrinking because sharing the territories with the indigenous communities imposing big restrictions on oil and gas extraction activities. Demand for hydrocarbon is down and oil and gas prices are falling.

Environmental awareness of the population increases, and demand for organic products witnesses considerable growth. Environmental and ethno tourism is flourishing.

Photo 20. Taken by Sergei Cherkashin,
Press Office of the Governor of the Yamalo-Nenets Autonomous District

NATURAL RECREATION AREA

Climate change has had an important impact on extractive industries. The perception of global environmental problems influences relevant environmental regulations on international, national and regional level. The world is rapidly adapting to alternative energy, leaving little room for Arctic oil and gas. Arctic fisheries benefit from this, although the sector struggles to adapt to rapidly changing conditions.

Most lands in the region have gained the status of specially protected and preserved areas. Large-scale industries and traditional activities are hardly possible on the territories. Research activities as well as limited local industries are sustained.

New projects on alternative energy are discussed. The legislation regulating alternative energy production and use is being developed.

Indigenous peoples gain strong land rights and strong constituencies. Non-aboriginal population enjoy stable, yet economically less developed living conditions.

The regional authorities and aboriginal communities are committed to preserve natural habitats. Loss of extractive economic interest results in a cleaner environment.

Land reclamation and remediation projects are carried out. Tourism and recreation activities are the priority in economics. There are several sanctuaries and reserves managed by different federal agencies, a large national park. Oil and gas installations become a tourist attraction; the region is popular with tourists because of its extreme climate conditions, the featuring Arctic attractions and wildlife, proximity of traditional indigenous territories. The region meets the recreation needs of a growing urban population, the reserves and national park have important nature conservation role.

The reserves protect lands and wildlife communities, including threatened animal species and plants.

The tourism is regulated by regional laws; there is a lack of tourist infrastructure and facilities.

Photo 21. Taken by Denis Zinoviev, University of Tyumen

Table 9 summarizes the scenario narratives and gives the key patterns for the main sectors of development in the Russian Arctic.

Table 9

Scenario narratives

	Gas Land	Re-industrialized zone	Reindeer pasture	Nature recreation area
Driving force	High demand in hydrocarbon, high oil and gas prices. Availability of resources because of climate change and ice melting	Demand for gas drops. New revenue sources needed. Climate change and environmental degra-dation are very high	Indigenous peoples gain influence in the international arena. Alternative ways of indigenous economic development	Negative effects of climate change. The country's obligations and responsibility. Increasing demand for Arctic tourism
Resource use pattern	Intensive. Best available technologies	Efficient. Carrying capacity is considered	Inefficient, old technology. Regulated. Restrictions imposed	No hydrocarbon use. Use of common mineral resources for local needs
Land use pattern	Intensive, unsustainable. Public ownership, licenses on subsoil use	Sustainable and scientifically approved. Public and private ownership; regional regulations prevail	Combination of intensively used pastures, plots used less intensively, and abandoned pastureland. Overgrazing. Indigenous strong land rights are strong	Sustainable use. Tourism infrastructure. Preserved lands sanctuaries, vast areas of abandoned pastureland
Indigenous	Limited access to land resources. Some agreements and support from companies	Traditional activities co-exist with industries. Co-management of resources	Strong state support. Traditional way of life with new economic activities	Strong land rights and strong constituencies. Traditional activities are limited
Environment	Environmental degradation	Sustainable development	Excessive amount of reindeer. Land reclamation/ remediation is needed	Remediation period. Protection of lands and wildlife. Arctic cleanup projects
Regulations	Insufficient international regulations. Little or none domestic compliance	Soft rules and compliance. Sustainability standards and guidelines	Clear and precise. Incentive-based policies and agreement systems	Hard law treaty on non-use and protection. Regional regulations of recreation activities. Regulations on specially protected areas

Based on these narratives the four scenarios can be analyzed and evaluated from the point of view of various stakeholders.

FINAL COMMENTS

The Arctic and related issues is an extremely hot topic in the 21st century. The reasons for this new focus is that the Arctic is becoming a geopolitically important region. Activity here would give a new impulse to security, transportation, logistic and ecological projects.

New economic prospects in energy, mineral and maritime transport sectors significantly change the traditional use of the Arctic territories. With economic activities on the rise, environmental safety seems an absolute priority, raising the need for a qualitatively new level of legal regulations in this critical area. The Arctic states which are active players in the region, such as Russia, Norway, Canada are changing their Arctic policies and amending laws and regulations related to the Arctic in order to encourage sustainable use of the region. Environmental protection is an intrinsic part of any Arctic project.

With the world's longest coastline in the North, Russia views environmental protection in the Arctic as a strategic goal. The objectives of the country in the Arctic region is to preserve a healthy environment, to provide a stable access to natural resources, to protect the region's unique flora and fauna, and prevent emergencies which can cause global environmental impact. These objectives can be met only through the concerted efforts of international community, federal and local authorities and specialists working in the Arctic.

In the spirit of multiple industrial projects and increasing burden on the Arctic lands and ecosystems there is unprecedented need for professionals possessing knowledge and real understanding of what is happening in the Arctic, how fragile the Arctic ecosystems are and what can be the ways and tools to protect the Arctic environment.

In response of the tremendous changes and challenges in the Russian Arctic this book aims to provide a general overview of the Arctic use with a special focus on the Arctic land use in Russia. The textbook is intended for stakeholders, community representatives, public authorities and specialists involved into the Arctic projects and decisions-making process. The volume might also be of interest for a non-specialist readership whose goal is to use the Arctic sustainably and to preserve this unique region for the benefit of present and future generations.

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