Economic and geopolitical aspects of developing the Northern Sea Route

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Abstract. The present paper is devoted to define contemporary essence and logic of developing the Northern Sea Route (NSR) for the near future of Russia and beyond. A global nature of such upcoming processes as melting the Polar Ice Cap, depletion of readily available oil/gas reserves (causing a rise in prices on such commodities) and emerging confrontation between interests of circumpolar countries and non-circumpolar countries (on the background of a fast-growing economic and military power of latter and an ambiguity of legal status of using the Arctic space and its mineral resources) is defined. The features of Russian developing the NSR are historically and logically depicted and a decisive role of state political decisions and investments concerning the NSR is shown. The topological model of Russian Siberian-Arctic infrastructure grid where the NSR serves as its backbone is proposed. The said model and comparing data between domestic and trans-shipment turnover of cargo through the NSR have reinforced the hypothesis of the special importance of domestic functions of the NSR. A SWOT-matrix permitting to describe a current situation and future scenarios for the NSR is presented. The findings of the study allowed defining limitations and a vector of future research.

1. Introduction
Globalization has drastically impacted on the canvas of international trade corridors by increasing the density and dynamism of global merchandise flows not just between continents but also between West and East regions of the Eurasia continent. This megacotinent – located primarily in the Northern and Eastern Hemispheres and bordered by the Atlantic Ocean to the west, the Pacific Ocean to the east, the Arctic Ocean to the north, and by Africa, the Mediterranean Sea, and the Indian Ocean to the south – could be considered as an almost single entity – but in a geographical sense only. Factually, West and East had very different own histories in all dimensions – cultural, religious, language as well as social, political and industrial/military development ones. Such dissimilarities have created – in the course of development of East-West and West-East physical and virtual intensive communications – historical steady state logistics channels between European and Asian countries. However, due to the well-known – military-politically and ideologically confronted – geopolitical situation during seven decades of 20th century, the very shortest way between these countries (e.g., like the Silk Road) became impossible due to so-called “Iron Curtain” a phenomenon that existed until the end of the Cold War in 1991. The said phenomenon plus a general confrontation between “socialist and capitalist campuses”
forced international trade logistics to by-pass overland routes between Northwest Europe and Northeast countries of the Eurasia continent.

As it was calculated [1], over 80 per cent of world merchandise trade by volume and over 70 per cent by value was carried by sea and world seaborne trade volumes were estimated to grow at a compound annual growth rate of 3.2 per cent in 2017–2022. The same increasing trend existed in previous decades and expected to be continued in the near future. As they said, oceans did not separate people they connected them and did this by the cheapest way. Those who were skilled in the Art predicted that the Northern Sea Route, the NSR, (the said term was assigned as the English equivalent to Severnyy morskoy put, or Severmoorput, in Russian; but the same sailing corridor was often known outside Russia as the Northeast Passage, or the NEP, by analogy with the NSR) should be largely free of ice in the summers by 2050 if the Polar Ice Cap continued to melt at current rates [9]. So they began to discuss the economic attractiveness of the NSR as a shorter transportation corridor (table 1). However, the NSR was not considered as a real competitor for land transportation transit corridors, such as a “remake” of the historical Silk Road (“China the West” corridor that had been closed at first by Ottoman Empire boycott trade with China and then by the “communism-capitalism” confrontation existed in the main part of 20th century); however, this “remake” received nowadays an additional option of Baikal-Amur Mainline for a future development and Russian Trans-Siberian railway, or the TSR (initially, Moscow-Vladivostok transportation arm), that could not become the main transportation land corridor for merchandise flows from Japan and Republic of Korea due to lasting till now splitting Korea into North and South ones and their political-military confrontation.

Table 1. Alternative Shipping Routes connecting Hamburg with East Ports, in nautical miles (in comparison with the NSR)

| Shipping routes via: | From | Vancouver | Yokohama | Hong Kong | Singapore |
|----------------------|------|-----------|-----------|-----------|-----------|
| Northern Sea Route (NSR) | N.A. | 11,507 | N.A. | N.A. | N.A. |
| North West Passage* | N.A. | 1,00 | N.A. | N.A. | N.A. |
| North West Passage / NSR | N.A. | 1,00 | N.A. | N.A. | N.A. |
| Suez Canal | 15,377 | 11,073 | 9,360 | 8,377 |
| Suez Canal / NSR | 2,32 | 1,60 | 1,12 | 0,86 |
| Cape of Good Hope | 18,846 | 14,542 | 13,109 | 11,846 |
| Cape of Good Hope / NSR | 2,84 | 2,10 | 1,57 | 1,22 |
| Panama Canal | 8,741 | 12,420 | 12,920 | 15,208 |
| Panama Canal / NSR | 1,32 | 1,80 | 1,55 | 1,56 |

Source: data from [17, p.1, table 1.1] (accessed May 18, 2018) were processed by authors.

The history of navigation on the NSR had its beginning somewhere in the mid of 17th century. However, the first chart showing how to cross the Arctic Ocean in this area was realized in the third quarter of 19th century. The very heavy Arctic ice was the main reason of losing ships and people of first Arctic expeditions. Initially, in Soviet time, the main driver for developing cargo shipping on the NSR was so-called “northern delivery” (severny zavoz) to supply the Far North regions of USSR with almost all merchandizes necessary to work and survive in these extremely important from economic and military viewpoints regions. Transit West-East-West commercial voyages for foreign freight were not considered (and even were banned) that time. Then, immediately after the WW2, the USSR had only a few not-so-powerful icebreakers, which were not able to secure the entire commercial voyages on the NSR. Despite the fact that in Soviet times (1964-1990) a numerous icebreaker fleet (4 units with power plant ≥ 45 000 BHP; 9 units with power plant < 45 000 BHP but ≥ 20 000 BHP; 12 units with power plant < 20 000 BHP but ≥ 10 000 BHP – calculated by the authors using data from [11]) has been built, the NSR was factually closed for foreign vessels due to military and political barriers. During and after so-called pere-
stroika, cargo shipping on the NSR collapsed in the absence of Russian state budget support. In spite of the fact that it was allowed foreign vessels to navigate on the NSR (1987), first real steps of revitalizing the NSR as an international transit transport corridor were revealed only from the year 2009. There were no questions that – under domination of state property in USSR – the Soviet state was a single political power and investor for developing the NSR having a well-understood strategic military and economic meaning should be better evaluated in our days. By the way, it was a reason of poor (backroom) statistics on NSR’s development and maintaining that conserved its ambiguity till today; and a reason of a set of lacunas in the table 2 herein.

For contemporary Russia, the task of modernizing and converting the NSR in a reliable and economically efficient and almost year-round transportation corridor was defined as a vital task for building an integral social and economic infrastructure to engage a gigantic Siberian potential in the future development of Russia. The mega-grid of the said infrastructure could be formed by Siberian rivers crossed the country space between the South economically developed belt (formed along the TSR) and Russian Arctic regions (fig. 1). Modern transportation technologies (e.g., “river-sea” boats, screen-plains, satellite communication means – including the Russia made GLONASS, a space-based satellite navigation system providing an alternative to GPS) and recent Russian government political decisions [2] [3] gave a realistic support for rather fast creating the said infrastructure.

### Table 2. Some data on the cargo/passengers flows transited the NSR in years 2011-2016 in comparison with total volume of cargo transportation through the NSR.

| Years | 2011* | 2012 | 2013 | 2014 | 2015 | 2016 |
|-------|-------|------|------|------|------|------|
| Amount of vessels | 26** | 46 | 71 | 22 | 18 | 39 |
| Rate to 2012 data | | 100 | 154 | 49 | 39 | 85 |
| Quantity (metric tons) | N.A. | 1 261 545 | 1 355 897 | 274 000 | 39 586 | 214 513 |
| Rate to 2012 data | N.A. | 100 | 108 | N.A. | 3 | 17 |
| Gross Registered Tonnage/Tons | N.A. | 1 397 051 | 463 928 | N.A. | N.A. |
| Rate to 2013 data | N.A. | N.A. | 100 | 33 | N.A. | N.A. |
| Quantity of passengers | N.A. | N.A. | N.A. | N.A. | 137 | 246 |
| Average NSR passage time (days)*** | N.A. | 9,8 | 11,8 | 17,1 | 10,6 | 14,3 |
| Total cargo transportation volume along the NSR | 820 800 | 3 895 900 | 3 914 001 | 3 982 000 | 5 432 000 | 7 266 000 |
| Share of the NSR’s transit | N.A. | 0,325 | 0,346 | 0,068 | 0,007 | 0,003 |

**Notes:**

* First year of a noticeable increase of foreign carriers to NSR transits while relevant Russian government programs began to revitalize the NSR since year 2009.
** Plus 14 vessels have been marked as “ballast”
*** These data were more susceptible to weather factors than to economic/geopolitical ones.

**Sources:** main set of data was collected from [8] (accessed May 18, 2018) and processed by authors; quantity (metric tons) for 2014 - The Rare Earth Magazine, JUN01, 2016; www.bellona.ru, APR09, 2014
The North Pole

Russian Arctic Zone

Northern Sea Route

Ob River

Yenisei River

Lena River

Trans-Siberian Railway

Figure 1. Topological model of Russian Siberian-Arctic infrastructure grid where the Northern Sea Route serves as its backbone

Source: designed by authors

2. Economic aspects of using the North Sea Route

The land-link between Asia and Europe – among the oldest trade routes in the world mentioned above – was for a rather long time not in use for any large-scale intercontinental trade; for containerized cargo especially. Hence, the total volume of international containerized cargo shipped using land transportation option between Asia (China mainly) and Europe was very limited. Some estimations assessed that the said rail transportation, in particular the TSR, could account for up to 3-4% only of an average volume for 2014-2017 period, stemmed mainly from the North of China and the both Koreas. Besides, the distance between Northwest-European ports and the Far East was reduced approximately 40% by using the NSR as an alternative route compared to the traditional one through the relatively shallow Suez Canal (synonym: Maritime Silk Road, MSR). So, large-capacity vessels have been forced to circumambulate Africa in order to enter the Atlantic Ocean. Therefore, the NSR had for long attracted interest from observers, shipping companies and scholars because of its shorter distance and, hence, a time consumed (table 1) between Atlantic and the Pacific ports of origins/destination. For comparison, according to some updated calculations [19] the great-circle distances taken from the GeoDist database from CEPII gave economies in terms of distance between ports of shipping (in Netherlands, United Kingdom, Belgium, and Germany) and ports of destination: Taiwan – 16-20%; China – 22-25%; South Korea – 30-33%; Japan – 36-39%.

Despite poor statistics on NSR traffics (due to several changes in defining official NSR’s borders, careless monitoring and, perhaps, paranoid secrecy of Soviet period) certain statistics on sea ice concentration and ship traffic during a yearly cycle (table 2) permitted to formulate following considerations: (1) a share of (1) foreign participation in the NSR transit was geopolitically susceptible – e.g., after the Ukraine crisis began (2014) the more or less significant increase of the NSR transit was revealed in year 2016 only (however, there are additional nature and economic factors for decreasing the NSR transit at the same period – unfavorable changes in ice coverage and declining oil/gas prices, respectively); (2) international economic aspects of using the NSR became to prevail the geopolitical ones; indeed, for year 2017 the volume of NSR transit achieved 273 000 MT: (3) Russian government politics should be accentuated on domestic transportation tasks and success could be got in this strategic direction of developing the NSR should be the best PR for worldwide NSR’s services offering.
They said [18] that currently the NSR was considered as a Russian internal sea route where international shipping was generally welcome but most likely without big hopes of being the only source to cover the huge investments necessary to modernize, maintain, and (potentially) expand the existing icebreaker fleet with new superpower units, infrastructure network along the NSR and corresponding satellite tracking/monitoring system. On the other hand, they should consider the NSR as a backbone of a gigantic infrastructure grid (fig. 1) supporting socio-economic development of offshore Arctic Ocean regions and Siberian ones where there are such obstacles for creating railroads and/or road networks as a harsh climate and an ambiguity of permafrost soils in the light of continuing global warming. There were two main intra-Russian traffics in the mainstream of the NSR: (1) outbound one – mineral resources, hydrocarbons, and timber for exports and domestic use and (2) inbound one – goods for life support, equipment, construction materials and other capital goods and, and it should be considered, defense goods. Consequently, while the NSR was of regional relevance and potential importance as a niche route [18] for a modest quantity of foreign transit goods on the background of much more significant and fast growing domestic and Russian export deliveries (e.g., 2017 intra-Russia NSR traffic volume was 9,73 mln MT), the NSR’s geopolitical and geo-economic relevance, especially in the sense of searching for global trade patterns, was estimated as rather limited. However, nowadays geopolitical factors played a decisive role and even prevailed over economic ones (e.g., the recent story with two Mistral helicopter carriers have been built but not handed over to Russian customer). Arctic region was many times called as a perhaps last unopened pantry of energy and other vital resources on the Earth and it was a good reason to consider Arctic as a focus of many geopolitical interests.

3. Geopolitical factors concerning the North Sea Route
Geopolitical position on the globe, optimistic estimations of energy resource potential and – in the frame of sustainable development concept – ecological significance of the Arctic region for the rest of the Earth have been drawing attention of the most part of nations on the eve of 21st century. The United States Geological Survey estimated (2008) that 22 % of the world’s oil and natural gas could be located beneath the Arctic ice [20]. Even three-four decades before, they had greatly increased interest in the Arctic region not only from so-called circumpolar Nations or “Arctic Eight” (Canada, Finland, Denmark with Greenland and Faroe Islands, Iceland, Norway, Russia and USA due to Alaska), but other states located far from borders of the said region: other EU-countries and certain countries of the Asia-Pacific Region (first of all, China, India, Japan, Singapore, and South Korea). Along with using and building powerful icebreakers in non-Arctic countries (e.g., China, Germany, France), those interests in Arctic zone could be attested to by their observer status in the Arctic Council (China, France, Germany, India, Italy, Japan, Netherlands, Poland, Singapore, South Korea, Spain, Switzerland, United Kingdom). The resource and military importance of Arctic attracted nowadays such international organization as NATO. For Russia, began the development of the polar region eight centuries ago, the Arctic remains today an integral part of the Russian geopolitical space. Russian Arctic zone (RAZ) has been estimated as a set of the most important in economic and military sense regions of Russia. This zone made a regional contribution in the national income of Russia equal to 11% (with only 1% of country’s population living therein) 11% / And up to 26% of Russia’s exports were stemmed from this zone [7]. Besides, the Arctic region was the only region where Russian and U.S. interests were vis-à-vis confronted in geographical sense. During the Cold War the naval (mainly, submarines) and air forces (strategic bombers) of both countries constantly patrolled over and under the Arctic ice fields, respectively. Nowadays, according certain sources, such situation could be in some ways considered as a recovered one. However, even after president Putin’s Munich speech (2007) this viewpoint was not a common one. For example, it was noted [13] that the Norwegian government, fortified by the country’s long history of peaceful co-existence with Russia considered the said situation as “a return to a more normal level of activity for a major power with legitimate interests in the region” emphasizing that it could not be considered as Russian military developments directed against Norway.

In view of what has been said above, in the 2014 Military Doctrine of the Russian Federation, the Arctic was mentioned as a region where the Armed Forces must protect Russia’s national interests...
even during peacetime. Contrary to the facts that Russia’s policy was permanently declared as an appeal to cooperation some Western (mainly, American) politicians and journalists continued to accuse Russia striving to make its dominancy in Arctic. Indeed Russia, in the last decade, has increased a number of Arctic military forces, organized military drills, opened or reconstructed military bases, created powerful icebreakers, and established advanced radar stations to enhance its control of the said region. However, Russia had in Arctic zone (2010), in comparison with USSR (1980s) following levels of heavy armaments (calculated by authors using data from [3]): submarines – 0.17 (SSBN, Strategic Submarine Ballistic Nuclear – 0,18); aircraft carriers – 0,50; larger ships – 0,23; auxiliary vessels – 0,16; aircrafts – 0,25. Such a sharp decline in these levels may indicate that many of Russia’s military-related activities are pragmatic and cooperative in nature – minimally necessary defensive measures. As the zone of the NSR becomes more suitable for economic development, Russia was improving its radar surveillance and communication therein. The same could be said about developing long-range radar systems and drone bases that were destined to enhance control and surveillance over Russia’s oil reserves and maritime shipping. For contemporary Russia, inherited after turbulent 1990s almost open Northern state border, the Arctic remained an integral part of the Russian geopolitical space, both in global economic and military sense.

4. Some notes concerning developing the North Sea Route
A remarkable foresight for a future exploiting the NSR could be found, for example, in outputs of the joint research project “Feasibility and Reliability of Shipping on the Northern Sea Route and Modeling of an Arctic Marine Transportation & Logistics System” [3]. A remarkable feature of the said project was presented not only due to high professional levels of corresponding participants but due to their geographical positions regarding to the topology of the NSR – two edges (Norway and South Korea) and the main course (Russia).

Russian resource extracting industries were permanently faced – along the NSR and in Russia’s Arctic zone (RAZ) as a whole – with heavy operational sea/land conditions including: (1) a short drilling season, (2) very long inbound and outbound supply chains, (3) extreme cold temperatures most of the year, (4) storming, (5) thick icing (sometimes, up to 4 meters), (6) full darkness during so-called “Polar night” (lasting about one hundred days), (6) fast changing sea-ice conditions, (7) heavy fogs, (8) offshore operations in deep waters, and (9) increased coastal erosion and permafrost thawing in the summer impacting land-based infrastructure by destabilizing foundations.) Almost all of these factors could be mitigated or even minimized under the condition of well-organized and technologically supported logistics of the NSR. Nevertheless, as it was announced in the Annual Presidential Address to the Federal Assembly (2018) Vladimir Putin said [15]: “The Northern Sea Route will be the key to developing the Russian Arctic and Far East.” Taking into account several precedents (2014 – Sochi Olympics; 2018 – Crimean Bridge) they should seriously and positively estimate perspectives of future developing the TSR.

For contemporary Russia, the task of modernizing and converting the NSR in a two-way reliable and economically efficient transportation West-East-West corridor was defined as a vital task for building an integral social and economic infrastructure to engage a gigantic Siberian and Far East regions potential in the future development of Russia. The mega-grid of the said infrastructure (fig. 1) could be formed by Siberian rivers (Ob, Yenisei and Lena) crossed the country space – very rich with mineral and forest resources but having an undeveloped infrastructure; partly, due to between the South economically developed belt (formed along and near the TSR) and Russian Arctic regions. Modern transportation technologies (e.g., “river-sea” boats, screen- plains, satellite communication means – including the Russia made GLONASS, a space-based satellite navigation system providing an alternative to GPS) and recent Russian government political decisions [2] [3] gave a realistic support for rather fast creating the said infrastructure.

As well-known, the classical definition of sustainable development was formulated as such development of that meets the needs of the present without compromising the ability of future generations to meet their own needs. This general formula has found its realization in directions of the socio-
economic development of the Russian Arctic region in such ways as [16]: the social infrastructure, the institutional sector, the human development, the industrial sector and the ecology. As it was stated in the “Basics of the State Policy of the Russian Federation in the Arctic for the Period till 2020 and for a Further Perspective” (hereinafter referenced as the “Basics”), low sustainability of ecological systems determining the biological balance and climate of the Earth, and their dependence even on insignificant anthropogenen impact was one of specificities of the Arctic zone of the Russian Federation to be taking into account in formatting the Russia’s Arctic policy. Corresponding items could be found in programs of corporative social responsibility elaborated by and to be followed by so-called natural monopolies (e.g., Gazprom) that could be estimated along with the state as powerful drivers of developing the NSR and RAZ as a whole.

5. Considerations and limitations
After reviewing a substantial set (about 60) of recently published academic articles as well as reports and statistics concerning the NSR and issued by corresponding national and international organizations it became possible to make some considerations concerning the near future of the NSR in the light of economic, natural, technological and geopolitical factors. A summarized authors’ vision of issues discovered by the present article was displayed herein in the SWOT-matrix format (table 3). In addition some comments in brief were presented in the following text. First of all, almost all of factors mentioned above, one way or another, could be correlated with transportation risks of different nature.

Unfortunate combination of Arctic climate conditions, accidental events in aquatorium of the NSR, and processes in the relevant logistics management systems were recognized as the leading contributors to risks of ship accidents. The contemporary risk analysis [6] – done to make pilots and captains more experienced in conducting ships through the NSR – revealed that the East Siberian Sea had the highest probabilities regarding collision, foundering and grounding of the ship. Other regions such as Chukchi, Laptev, Kara and the Barents Sea had almost similar probabilities regarding grounding. The same time, foundering probabilities were very low in the said areas. Such knowledge helped to improve the risk management system on ships passing through the NSR.

In addition to improving these risk management systems on micro-level (vessels) it was defined as necessary to arrange measures for implementation of integrated approach to public and territorial safety in the RAZ for regions of future intensive and sustainable development in the context of expected climate changes (global warming) and other disasters include the following [7]: (1) establishing a network of integrated centers with the National Crisis Management Center as an informational hub connecting relevant regional and federal services and ministries for corresponding emergency monitoring, forecasting, and warning; (2) improving and practicing the ways and procedures of sharing the capabilities Russian System of emergency prevention and response (RSCHS); (3) assigning relevant Atomflot-operated vessels to operations of RSCHS emergency response forces; (4) arranging additional storage bases well-equipped for effective rescue operations; (5) developing innovative and improving existing technologies for rescue and other urgent operations at low temperatures; (6) using/improving applications of Arctic-conditions-adapted rescue aircrafts and satellite-based systems for rescue operations and monitoring (KOSPARS-SARSAT, Gonets and – in the future – Arktika).

In conclusion, while defining a future of the NSR, some comments to concentrated SWOT-analysis of NSR logistics services offers s (table 3) should be made. First of all, new basics for future development of the NSR as a part of the RAZ should be elaborated. Then, as it seemed to the authors, while elaborating these new state directives it should be better to consider the NSR not only as a vital part of the RAZ but as a part of wider “infrastructure grid” displayed above (fig. 1) as a topological model of Russian Siberian-Arctic infrastructure grid where the Northern Sea Route serves as its backbone. This statement could be backed by the principle of preserving integrity of product logistics flaws flawing in and out of the NSR. Such approach – from the very beginning, on the stage of conceptual designing new basics – could help to avoid/mitigate risks of additional logistics delays/disruptions could take place due to mismatching in “sea-river” interfaces.
| **STRENGTHS** | **WEAKNESSES** |
|----------------|----------------|
| → Reduced sailing time defining reduced production costs (fuel consumption, depreciation of vessel, salaries, etc.) | → Partly shallow waterway |
| → The most numerous and the most powerful in the world Russian fleet of icebreakers | → Sophisticated administrative procedures |
| → Specialized RF government programs on developing production/military/social infrastructure adjoining the NSR | → Underdeveloped circumlittoral logistics infrastructure along the NSR |
| | → Increased insurance premia |
| | → The predominantly one-way traffic with ballast (without a back-haul) |
| | → Icebreaker made channels are narrower than width of Panamax/Snesmax class tankers |
| ~ Supports from resource extracting companies (so-called natural monopolies) | ~ Severe climate and ice conditions |
| ~ PR as a result of international research and conferences | ~ Increased nature and operation (“Arctic influenced human factor”) risks |
| ~ Less CO2 global emission | ~ Some uncertainty in the legal regime of using the NSR |
| ~ Lack of sea piracy along the NSR | ~ Certain vulnerability to geopolitical risks |
| **OPPORTUNITIES** | **THREATS** |
| → New growth of oil/gas prices | → Substantial improvements in competitive advantages of the NWP |
| → Further global warming as a factor of increasing a time of Arctic navigability | → Expected increasing number of sea incidents due to more intensive traffic of oil and gas tankers |
| → Innovative solutions for Arctic sea logistics (e.g., satellite tracking ships/cargo, holistic digitalizing) | → Emerging competitors offering Northern transportation routes out of Russian exclusive economic zone (NWP or Transpolar Way) |
| → Substantial growth of Russian oil and gas transportation (e.g., due to fast development of the Yamal LNG project) | ~ Strategic alliancing with companies from Arctic as well as non-Arctic countries |
| ~ Weakening a competitive advantage of the MSR due to an aggravation of geopolitical situation inspired by international territorial disputes of China and its confrontation with U.S. (Malacca and Suez bottlenecks) | ~ New economic and political counteractions against Russia’s expansion in Arctic zone |
| ~ Entering in force the Polar Code | ~ Revitalizing international waters disputes |
| ~ More clear Russian legislation and administrative procedures concerning the NSR users | ~ Exacerbating geopolitical “soft power” actions against “Russian Arctic expansion” |
| ~ Further world economic recession | ~ Exacerbating actions and aggressive media politics of Greenpeace or similar NGO |
| ~ Hidden counteractions from the side of non-Arctic shipbuilding industry stakeholders | **Legend:** |
| → Direct impact | → Indirect impact |
| ~ Indirect impact | **Source:** compiled by the authors on the basis of some sources listed in References herein. |

In conclusion, while defining a future of the NSR, some comments to concentrated SWOT-analysis of NSR logistics services offers (table 3) should be made. First of all, new “Basics” for future development of the NSR as a part of the RAZ should be elaborated. Then, as it seemed to the authors, while
elaborating these new state directives it should be better to consider the NSR not only as a vital part of the RAZ but as a part of wider “infrastructure grid” displayed above (fig. 1) as a topological model of Russian Siberian-Arctic infrastructure grid where the Northern Sea Route serves as its backbone. This statement could be backed by the principle of preserving integrity of product logistics flaws flawing in and out of the NSR. Such approach – from the very beginning, on the stage of conceptual designing new “Basics” – could help to avoid/mitigate risks of additional logistics delays/disruptions could take place due to mismatching in “sea-river” interfaces.

Naturally, being understood a role of the Arctic in the planetary ecology the authors came to conclusion that the concept of sustainable development had to thread many articles of expected “Basics”. The mode of NSR functioning should be of such style that permitted not only to ensure outbound logistics flows (crude oil, LNG, timber, ore, etc.) and inbound logistics flows (capital goods, vital resources, etc.) but realize tasks of developing sustainability logistics. The latter could comprise of implementing innovative eco-friendly technologies; such as, nuclear icebreakers, movable nuclear power blocs, waste recycling plants, etc. should include implementing well-branched network of ground/space weather stations, multichannel communication lines, and IT-technologies permitting to manage NSR’s traffic in as much effective and efficient as possible way. The “Basics” should twist together business, social and ecological decisions (so-called 3P-paradigm – Profit, People and Planet) in such a way that was in good conformity with the main concept of sustainable development [16]. For this purpose, not only investments and technologies but NSR focused education for sustainability should be provided.

It would be useful to stipulate in the “Basics” a primacy of domestic and Russian export tasks to be resolve with help of the NSR. Positive outputs of the said tasks resolved should become the best evidence of well-arranged, effective and efficient infrastructure of the NSR. In this case, the NSR’s transportation option should be rather easily converted from buzzing topic of today (compare: one day Suez traffic was approximately equal to an annual one of the NSR) into a real competitive transportation option. The said option should be supplied with well-developed coastal logistics infrastructure (navigation, pilotage and rescue services), space tracking/monitoring system, and powerful icebreakers. As a result, geopolitical confrontations and emerging Arctic territorial disputes should be attenuated by economic and financial considerations stemmed from expected successful functioning of the NSR. Besides, an investment attractively should be augmented due to same reasons.

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