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Questions of justice and sustainability: The case of submarine cables in the Arctic

Daria Shvets*

Abstract: Submarine cables, as the backbone of the world's increasing connectivity, are gradually reaching the North. Compared to resource extraction sectors like mining, oil, and gas, the laying and maintenance of submarine cables are less harmful to nature and have a lower impact on soil, air, and sea. This activity has positive environmental aspects. However, it may also bring negative consequences due to a lack of scientific knowledge and the increased presence of cable ships in the Arctic. On the social side, submarine cables, when extended by land-based infrastructure, tend to provide a more reliable internet connection, enhance Arctic connectivity with the rest of the world, and ensure the Northern regions' involvement in global affairs. Simultaneously, it interferes with the livelihoods and traditional ways of life of Northern communities, involving younger generations in technology development, impacting indigenous people, local producers, and endangering domestic traditions and habits. Therefore, this relatively new economic activity is worth analyzing from both environmental and social justice perspectives in the context of integrated sustainable development of the Arctic. This article aims to raise awareness regarding submarine cables, providing an Arctic legal framework for them, followed by recent updates on submarine cable activities. It offers an overview of the environmental and social impacts of submarine cables and concludes with preliminary proposals for their sustainable development in the Arctic.

Keywords: submarine cables Arctic justice Arctic communities sustainability connectivity.

(A) THE LEGAL FRAMEWORK OF SUBMARINE CABLES IN THE ARCTIC

It is estimated that 95% to 98% of all international communications are currently carried by submarine fiber optic cables.[1] There are more than five hundred cables laid on the international seabed, and this number continues to grow every year.[2] Submarine cables are not only planned for the most populated areas of the world but also extend to remote areas, including the Arctic. The increasing number and volume of data coming through submarine cables highlight their tremendous importance as critical infrastructures for modern connectivity.

Submarine cables in the Arctic are not subject to specific regulations through a separate international treaty or bilateral agreements among Arctic states. Instead, all

* Universitat Pompeu Fabra, daria.shvets@upf.edu.

1 D. Burnett, T. Davenport, R. Beckman, Submarine cables: *The Handbook of Law and Policy*, Leiden: Martinus Nijhoff, 2014 p. 3; E. Perez-Alvaro, "Unconsidered Threats to Underwater Cultural Heritage: Laying Submarine Cables", *Rosetta*, vol. 14, 2013, pp. 54-70, p. 54, available at http://www.rosetta.bham.ac.uk/issue14/perezalvaro.pdf.

2 See free and regularly updated submarine cable map by Telegeography, an online resource available at http://www.submarinecablemap.com/submarine-cable/polar-express.

submarine cables are governed by the general norms of the United Nations Convention on the Law of the Sea (UNCLOS).[3] All Arctic states, except for the United States, are members of UNCLOS and are considered coastal states according to its provisions.[4] Despite the United States not being a party to UNCLOS, it is still bound to respect its provisions since the majority of the Convention's rules are considered customary international law. UNCLOS applies to the Arctic Ocean in the same manner as it does to any other ocean globally, but it differentiates the Arctic's unique and vulnerable environment from other parts of the ocean by making a reference to ice-covered areas.[5] As the Convention primarily establishes a general framework that requires further implementation, the Arctic states have developed their own national legislation concerning submarine cables while implementing the Convention. Consequently, a significant portion of the regulations pertaining to submarine cables exists at the domestic level, within the national laws of Arctic states.[6]

For instance, in Finland, the installation of submarine cables within its territorial sea follows standard regulations governing network construction and maintenance. Given that submarine cables serve as vital public communication infrastructure, introducing a new cable necessitates undergoing both an environmental assessment and a series of public hearings. Specifically, environmental permits are mandatory for submarine cables that have an impact on the seabed, while appropriation regulations come into play concerning private property.[7]

In Sweden, constructing submarine cables entails a comprehensive process regulated by multiple legal documents, the involvement of various authorities, and the requirement to secure diverse permits issued by the Swedish government. To establish the route for a new submarine cable within Swedish public waters, approval from the Legal, Financial, and Administrative Services Agency is mandatory, and a project must undergo an environmental assessment in accordance with the Swedish Environmental Code.[8] Additionally, matters concerning damage inflicted on existing submarine cables are governed by the Swedish Act on Liability to Pay Compensation for Damage Caused

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3 United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994), 1833 UNTS 397.

4 The updated list of members of the UNCLOS is available at the United Nations Treaty Collection website at https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&clang=_en.

5 See Article 234 of the UNCLOS according to which coastal states are granted "the right to adopt and enforce non-discriminatory laws and regulations for the prevention, reduction and control of marine pollution from vessels in ice-covered areas", United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994), 1833 UNTS 397.

6 In this article Finland, Sweden, and Norway were chosen merely as examples of domestic regulation implemented by Arctic states. For more complete overview including all Arctic states see D. Shvets, "The Legal Regime Governing Submarine Telecommunications Cables in the Arctic: Present State and Challenges", in M. Salminen, G. Zojer, K. Hossain (eds.), *Digitalization and Human Security; A Multi-Disciplinary Approach to Cybersecurity in the European High North*, Switzerland: Palgrave Macmillan, pp.180-185.

7 International Cable Protection Committee Members Database, The Act on the Protection of Certain Submarine Cables and Pipelines 145/1965, Finland, available at https://www.iscpc.org/.

8 Swedish Environmental Code 2000:61, available at https://www.government.se/legal-documents/2000/08/ds-200061/.

to Existing Submarine Cables and Pipes.[9] Broadly speaking, the Swedish regulatory framework encompasses several legislative acts that govern the laying of submarine cables in various maritime areas. Notably, the Swedish government underscores the significance of open and accessible broadband infrastructure for all citizens.

Norway has a dedicated legal framework specifically addressing submarine cables, known as the Act on the Protection of Submarine Cables and Pipelines.[10] This legislation primarily focuses on safeguarding submarine cables against various forms of damage and establishes the potential for compensation from vessel owners. Furthermore, the regulations concerning the fixed installations to which submarine cables are affixed fall under the purview of the 2008 Planning and Building Act No. 71, in addition to those contained within the Electronic Communications Act No. 83. It is worth noting that the Norwegian government possesses the authority to make decisions or grant consent for the compulsory acquisition of property titles or usage rights for the installation of electronic communications networks and related equipment.[11] The Norwegian Post and Telecommunications Authority, an autonomous agency of the Ministry of Transport and Communications, is responsible for supervising telecommunications services, including those provided by submarine cables.

Besides the broad framework provided by UNCLOS and the fragmented domestic laws of Arctic states, there have been limited initiatives in the region aimed at regulating submarine cables on a regional level regarding issues of equity and sustainability. Any legal norms addressing environmental and social concerns, if they do exist, tend to be isolated and disconnected from a justice-based approach. Some notable efforts to comprehensively address submarine cables fall under the Arctic Council's Task Force on Improved Connectivity in the Arctic[12] and Task Force on Telecommunications in the Arctic.[13] It could be argued that these Task Forces might have played a more active role in addressing submarine cable matters in the Arctic, including the promotion and assurance of justice. In particular, employing various forms of justice (substantive, procedural, distributive, retributive and recognition justice)[14] in the law-making process.

Addressing justice considerations during the installation and maintenance of submarine cables within the legal framework is a multifaceted issue that necessitates a comprehensive approach and common effort from all Arctic stakeholders. However, thus far, it remains uncertain whether robust and productive cooperation among all

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9 Swedish Act on Liability to Pay Compensation for Damage Caused to Existing Submarine Cables and Pipes 1996:518, available at https://www.government.se/legal-documents/2000/08/ds-200061/.

10 Opperud, H. (2010). Telecommunications regulation Norway. *Lex Mundi*. Available at http://www.lexmundi.com/Document.asp?DocID=1871.

11 Ibid.

12 See Final Report: Improving Connectivity in the Arctic by Task Force on Improved Connectivity in the Arctic, *Arctic Council*, 2019, available at https://oaarchive.arctic-council.org/server/api/core/bitstreams/1c7f2761-77cc-40f7-9995-9f1f36a6dee9/content.

13 See Report on Telecommunications Infrastructure in the Artcic. A circumpolar assessment, *Arctic Council*, 2017, available at https://oaarchive.arctic-council.org/server/api/core/bitstreams/08f2791c-5157-48f2-a340-917d1ec3cfd6/content.

14 See more on the forms of justice (substantive, procedural, distributive, retributive, recognition) in Factsheet "JUSTNORTH: Conceptualizing Justice for a Sustainable Arctic", available on the website of JUSTNORTH project https://justnorth.eu/wp-content/uploads/2023/03/Factsheet-for-JUSTNORTH.pdf.

Arctic states within the framework of the Arctic Council can be fully reestablished in the near future.[15]

(B) SUBMARINE CABLES AS AN ECONOMIC ACTIVITY IN THE ARCTIC

After providing the background regarding the legal regime of submarine cables in the Arctic, this section is dedicated to the latest updates on submarine cables projects in the Arctic and assesses the potential environmental and social impacts of cable activity. The installation of submarine cables is a relatively recent activity in the Arctic. When compared to long-established activities like fishing, navigation, and marine scientific research that have been conducted in the Arctic for many years, the introduction of telecommunications infrastructure to the region is a more recent occurrence. As of now, several submarine cable projects have been completed successfully in the Arctic, some are currently underway, and there is the potential for more to be deployed in the future. The first project completed in the Arctic was the Svalbard Undersea Cable System laid down in 2004, aimed at connecting Svalbard with the mainland of Norway. [16] Another project, undertaken in 2009, was the Greenland Connect cable system, which linked Canada, Greenland, and Iceland.[17] In 2017, the Greenland Connect North cable project was implemented. This particular route is situated along the west coast of Greenland connecting various small towns in the region.

In addition to regional connections, various efforts have been made to establish a transarctic cable network. One such initiative is ROTACS (Russian Optical Transarctic Cable System) which emerged in the early 2000s with the aim of linking Tokyo and London crossing the Arctic.[18] Another endeavor was the Polarnet Cable Project.[19] As part of this project, comprehensive marine survey operations were carried out, shedding light on the feasibility of installing an extensive cable line in the Arctic. The Arctic Connect Project, a cable system initiated by the Finnish company Cinia and the Russian telecom company Megafon, aimed to establish a connection between Norway and Japan.[20] While the development phase of the project has advanced as scheduled, and funding for this phase has been secured, stakeholders have collectively decided to temporarily halt the development of the project. The Quintillion Submarine Cable System was initially envisioned as a lengthy line connecting Tokyo to London via the Arctic. However, the

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15 See more about the future of Arctic governance in D. Shvets, K. Hossain, "The Future of the Arctic Governance: Broken hopes for Arctic exceptionalism?", *Current developments in Arctic law*, vol. 10, 2022, pp.49-63, available at https://lauda.ulapland.fi/handle/10024/65260.

16 Arctic Economic Council. (2016). *Arctic broadband, recommendations for an interconnected Arctic*, available at https://arcticeconomiccouncil.com/wp-content/uploads/2017/02/AEC-Report_Final-LR-1.pdf.

17 Ibid.

18 Juha Saunavaara, "Connecting the Arctic While Installing Submarine Data Cables Between East Asia, North America and Europe", in M. Salminen, G. Zojer, K. Hossain (eds.), *Digitalization and Human Security, A Multi-Disciplinary Approach to Cybersecurity in the European High North*, Switzerland: Palgrave Macmillan, pp.205-227, p.210.

19 Titarenko, E., "Polarnet Proekt zaruchilsya podderzkoi" [Polarnet project was granted support]. *ComNews*, 2017, available in Russian at https://www.comnews.ru/content/108946/2017-07-31/polarnet-proekt-zaruchilsya-podderzhkoy.

20 Saunavaara, J., "Arctic subsea communications cables and the regional development of northern peripheries", *Arctic and North*, *32*, 2017, available at https://doi.org/10.17238/issn2221-2698.2018.32.63.

project's full implementation did not materialize according to the initial plan, and only the first phase was completed. As a result, a cable line was established, linking small towns along the west coast of Alaska.[21]

So far, only the cable Polar Express entered an actual construction phase in the Arctic.[22] This project stands out as a unique endeavor, involving the creation of a transarctic submarine fiber-optic communication line spanning a total length of 12,650 kilometers. The primary objective is to connect Murmansk to Vladivostok via the shortest route linking Europe to Asia. Currently, construction work is underway, with the project slated for completion in 2026. The Polar Express cable's primary goal is to establish the geographically shortest telecommunications route between Europe, Asia, and America, thereby minimizing data transmission delays. Additionally, it seeks to advance the development of port infrastructure along the Northern Sea Route, foster the growth of the region's digital ecosystem, and expand the international backbone fiber-optic communication network. In the following two sub-sections, the potential environmental and social consequences stemming from submarine cables as an economic endeavor in the Arctic are examined. It aims to provide a deeper insight into how justice can be more effectively ensured and promoted in the region.

(1) Environmental impacts

Deploying submarine cables in the Arctic presents an exceptionally formidable undertaking due to the region's distinct climatic conditions and the absence of established protocols. There is a dearth of scientific knowledge regarding the precise short and long-term impacts on the Arctic marine environment. It is noteworthy that the installation of cables in the Arctic necessitates the use of specialized cable ships capable of navigating and laying cables in the frigid Arctic waters, rendering project implementation considerably more intricate than cable installations in other areas.[23] The Arctic Council has once expressed concerns about the necessity for cable providers to meticulously select their submarine cable routes, given the risk of ice scour in certain regions, and to establish dependable service backup plans for end-users.[24] The submarine cables activity brings with it both advantages and disadvantages concerning justice.

Among the advantages, the first one is the provision of a high-quality internet connectivity to remote Arctic communities that currently rely on satellites. For instance, the ability to conduct video conferences instead of traveling to distant cities or even

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21 D. Shvets, "The Legal Regime Governing Submarine Telecommunications Cables in the Arctic: Present State and Challenges", in M. Salminen, G. Zojer, K. Hossain (eds.), *Digitalization and Human Security, A Multi-Disciplinary Approach to Cybersecurity in the European High North*, Switzerland: Palgrave Macmillan, p. 187, pp. 175-203.

22 See updated information on the Polar Express submarine cable official website, available at https://xn--e1ahdckegffejda6k5a1a.xn--p1ai/.

23 According to standards established by the Polar Code (IMO's International Code for Ships Operating in Polar Waters), IMO Doc. MSC.385(94).

24 Report on Telecommunications Infrastructure in the Arctic. A circumpolar assessment, *Arctic Council*, 2017, available at http://library.arcticportal.org/1947/1/2017-04-28-ACS_Telecoms_REPORT_WEB-2.pdf.

other countries contributes to a reduction in carbon dioxide (CO_2) emissions.[25] This aligns with the pursuit of intergenerational justice by preserving the Arctic as an area for future generations. The second advantage lies in the comparatively non-invasive nature of submarine cable projects when contrasted with long-standing activities in the Arctic such as drilling, mining, and carbon extraction. Due to the relatively small size of submarine cables, their installation process minimizes contact with the seabed. Typically, the cables are not buried except in limited areas near ports and onshore installations, where they might be vulnerable to damage from fishing vessels, their anchors, or trails. This matter was explicitly addressed in a joint report by the United Nations Environment Programme and the International Cable Protection Committee, emphasizing that "the small physical size of a telecommunications cable implies that its environmental footprint is likely to be small and local […] a suggestion that is borne out by several studies".[26] The third significant benefit is the reduced likelihood of environmental catastrophes associated with submarine cables when compared to other economic activities in the Arctic. In the event of a submarine cable break, there are no consequences such as oil spills or other environmentally harmful incidents. The primary outcome of a cable break is limited harm in the vicinity of the breakage point. Generally, submarine cables are recognized for their environmentally friendly characteristics.[27]

Simultaneously, certain researchers argue that submarine cables could potentially have adverse effects on the Arctic marine environment justifying it by uncertainty regarding the impact of electromagnetic fields and thermal radiation on organisms that may be sensitive to these factors.[28] As a result, the potential for a noteworthy negative impact from submarine cables cannot be entirely dismissed. While the impact is minimized and confined, it is a factor that may warrant concern, especially in particularly fragile areas like the Arctic.[29] Furthermore, it is contended that a cable ship involved in the installation of submarine cables, as well as any other vessel traversing Arctic waters, faces the potential danger of colliding with icebergs or other ships. This elevates the likelihood of environmental repercussions stemming from such incidents, including but not limited to hazardous liquid spills, maritime accidents, or harm to the local flora and fauna. Lastly, the activities of a cable ship during the laying of submarine cables and subsequent cable maintenance procedures generate both noise and vibration affecting

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25 D. Burnett, "Impacts on international submarine cables by coastline state encroachment based in natural resources and environment" in L. Martin, C. Salondis, C. Hioureas, *Natural Resources and The Law of the Sea, Exploration, Allocation, Exploitation of Natural Resources in Areas Under National Jurisdiction and Beyond*; New York, Juris, pp. 147-184, p. 162.

26 Carter, L., Burnett, D., & Davenport, T. (2014). The relationship between submarine cables and the marine environment. In D. R. Burnett, R. C. Beckman, & T. M. Davenport (Eds.), *Submarine cables: The handbook of law and policy* (pp. 179–212). Leiden and Boston: Martinus Nijhoff Publishers, p. 9.

27 B. Heezen, G. Johnson, Alaskan submarine cables: A struggle with a harsh environment. *Arctic*, *22*(4), 1969, pp. 413–424.; E. Perez-Alvaro, "Unconsidered Threats to Underwater Cultural Heritage: Laying Submarine Cables", *Rosetta*, vol. 14, 2013, pp. 54-70, p. 54, available at: http://www.rosetta.bham.ac.uk/issue14/perezalvaro.pdf

28 T. Worzyk, *Submarine power cables: Design, installation, repair, environmental aspects*. Berlin: Springer-Verlag, 2009.

29 OSPAR Commission. (2009). *Assessment of the environmental impacts of cables*. Biodiversity Series 1, available at https://qsr2010.ospar.org/media/assessments/p00437_Cables.pdf.

marine biodiversity, as well as having the potential to disrupt coastal birdlife and wildlife in nearby regions.

(2) Social impacts

In the context of the social impacts of submarine cables, there are both advantages and disadvantages to their presence and active development in the Arctic as submarine cables connect this region with its remote communities to the rest of the world.

On the positive side, telecommunications create opportunities for local manufacturers and traders to promote and sell their products, contribute to the growth of tourism, attract investments to the northern regions, and generally support the sustainable development of the area.[30] Another benefit brought about by the Internet, facilitated by submarine fiber-optic cables, is access to high-quality distance learning. Through online platforms and courses, residents of the High North can enhance their knowledge, acquire new skills, and formalize their education. This is particularly valuable for remote Arctic villages where commuting to the nearest educational institution is time-consuming. Such broadband communication proves to be invaluable, especially when individuals need to balance their education with traditional practices like reindeer herding. Furthermore, submarine cables offer the advantage of creating online high-income employment opportunities for the local population. This can be especially relevant for retaining the younger generation in local villages, preventing them from leaving the Arctic. Beyond addressing individual concerns of the youth, it can also contribute to supporting domestic businesses and the local economy by promoting local products and facilitating business communication. Looking ahead, submarine cables also provide local Arctic communities with the potential for telemedicine. Accessing quality medical treatment on-site can be challenging for some northern communities due to a shortage of healthcare professionals and the long distances to the nearest hospital. Online medical consultations can serve as preliminary medical advice, potentially reducing the need for patients to travel to a hospital, saving time and money, and ensuring timely attention to health issues.

Simultaneously, there are certain disadvantages and even risks associated with the increasing presence of submarine cables in the Arctic. One noticeable trend is the growing dependence of Arctic communities on telecommunications, which is a cause for concern. While it offers opportunities, it can also exacerbate the social issue of eroding traditional practices, which are being replaced by modern technologies. The intrusion of telecommunications into traditional ways of life can lead to a loss of generational knowledge and increase the reliance of local communities on it. Furthermore, the availability of telecommunications and the option to order goods online pose challenges for the local economy, especially when competing with well-established, large brands. If major corporations can now deliver products to remote Arctic villages at lower

[30] N. Filimonova, M. Portugal-Ramirez, "The New Frontier for Human Cybersecurity: Russia's Cybersecurity Policies in the Arctic" in M. Salminen, G. Zojer, K. Hossain (eds.), *Digitalization and Human Security, A Multi-Disciplinary Approach to Cybersecurity in the European High North*, Switzerland: Palgrave Macmillan, p. 65, pp. 57-81.

prices, there may be less incentive to purchase locally produced goods, which are often more expensive and have a limited range of options. Finally, increased dependency on telecommunications is of concern in case of system's failure which has severe consequences if occurs.

(C) SUSTAINABLE SUBMARINE CABLES DEVELOPMENT IN THE ARCTIC

Developing sustainable submarine cables activity in the Arctic is essential for enabling better connectivity in the region while considering environmental and social impacts from cables. This section considers some preliminary proposals regarding sustainable submarine cables development in the Arctic and aspects to be considered while exercising decision-making. The Chairmanship of Norway in the Arctic Council (2023-2025) currently provides this country with an opportunity to increase global awareness regarding submarine cables and establish goals for their sustainable development in the Arctic region. In the framework of its Chairmanship, Norway as well as all future chairmanships to come shall advocate for international cooperation and agreements, policies and initiatives that prioritize justice, equity, and sustainability in the Arctic. Given the international nature of submarine cables, resumed cooperation among Arctic Council member states, indigenous communities, and industry stakeholders is paramount for fostering multilateral dialogues and agreements to ensure the sustainable development of submarine cables in the Arctic. Following carefully elaborated strategies of balancing social needs (*distributive justice*) and environmental knowledge (*substantive justice*) with governance (*procedural justice*) in the region may promote overall justice-based development of telecommunications in the Arctic.

First, there is a need for a stronger role of the Task Force on Telecommunications Infrastructure and Task Force on Improved Connectivity within the Arctic Council. They may take ownership of issuing recommendations to use the latest technologies to minimize disruptions to the seabed and marine life during installation. They may also advise on best practices on planning cable routes to avoid ecologically sensitive areas, migratory routes of marine mammals, and known nesting or feeding grounds of Arctic wildlife. The procedure of establishing regular monitoring and maintenance programs to ensure the long-term integrity and functionality of the cables may also be invoked by these bodies. Finally, policies and training of local personnel to participate in cable maintenance activities as well as creating local job opportunities in submarine cables industry is also one of possible sustainable development scenarios in the form of *procedural justice* for submarine cables in the Arctic.

Second, in the conversation about promoting and ensuring *recognition justice* in the Arctic in relation to submarine cables, involvement of indigenous peoples into the increasing digitalization of the North is required. Collaboration with local Arctic communities and environmental organizations to gather valuable insights and ensure their concerns are addressed constitute a form of a recognition justice and might become one of the ways of sustainable development of submarine cables in the Arctic. That may include, for instance, transparent and timely sharing of data on cable installation, maintenance, and environmental as well as social impact with relevant stakeholders. Local authorities shall ensure that Arctic communities have equitable

access to the connectivity provided by submarine cables harmoniously coexisting with their traditional values.

Third, there is a place for a public-private partnership in sustainable development of submarine cables in the Arctic in the form of *retributive justice*. Mostly to ensure long-term sustainability. Public partners can enforce sustainability standards in submarine cable projects, ensuring that they meet environmental and social objectives over their lifecycle. This might include regular environmental assessments, adherence to international norms, and responsible cable disposal practices and relevant liabilities for noncompliance. On the other side, private partners can develop robust and resilient cable designs that can withstand Arctic conditions, including ice, extreme cold, and shifting icebergs. Use ice-class vessels specifically designed for Arctic conditions to lay and maintain the cables is also on a private sector's responsibility. Public-private partnership can also support research initiatives to better understand the potential environmental and social impacts of submarine cable projects. This research can form sustainable development practices of submarine cables activity in the Arctic. This forms a *distributive justice* approach that ensures fair allocation and distribution of pros and cons raising from submarine cables activities.

Finally, the role of law in sustainable submarine cable development in the Arctic is crucial for ensuring that such projects are conducted in an environmentally responsible and socially equitable manner. Substantive justice-based assessment in the regulatory field on the local level of Arctic states is the way towards social and environmental sustainability of submarine cables in the Arctic.

(D) CONCLUSION

The deployment of economic activities in the Arctic, particularly the installation of submarine cables, presents a multifaceted challenge that requires a delicate balance between promoting various forms of justice, ensuring social well-being, and safeguarding the environment. As it has been explored in this article, submarine cables in the Arctic offer both opportunities and challenges.

On the positive side, submarine cables bring high-quality internet connectivity to remote Arctic communities, fostering economic development, tourism, and educational opportunities. They create the potential for online employment and telemedicine, offering solutions to longstanding challenges in the region. However, the potential downsides were also examined, including the risk of disrupting traditional ways of life, the dependency on technology, and the challenges faced by local businesses.

By prioritizing justice in its various forms (substantive, procedural, distributive, retributive, and recognition), by considering social well-being of the subjects of justice (Arctic inhabitants), and environmental sustainability of the object of justice (the Arctic nature) in submarine cables deployment in the Arctic, this paper contends that it is possible to strike a balance between advancing connectivity and preserving the region's unique ecosystems and traditions.