CHAPTER TWENTY-FOUR

SAFEGUARDING SUBMARINE CABLES: STRATEGIC MEASURES FOR INDIA'S SECURITY AND CONNECTIVITY

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Connectivity is the new geography

— Parag Khanna, *Connectography*, 2016

Abstract

Submarine cables, which carry most of the world's international data, are vital to global connectivity and economic stability. This chapter explores India's role in protecting these cables in the Indo-Pacific amidst rising geopolitical tensions. It identifies key—structural, legal, and geopolitical—challenges and offers recommendations, including strengthening legal frameworks, enhancing international partnerships, and building domestic repair capabilities. These measures aim to secure the resilience of this critical infrastructure and reinforce India's position in the global digital economy.

Introduction

Submarine cables, which carry 95% of the world's international data, are critical infrastructure enabling global communication and economic activity. In the Indo-Pacific region, one of the most strategically significant regions in the world, India's geopolitical position places it at the crossroads of major international data routes. As global dependence on undersea cables grows, protecting these networks has become both a national security and global connectivity priority for India. The country's emerging role as a submarine cable hub enhances its economic competitiveness by positioning it as a key player in the digital economy while

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simultaneously elevating its strategic importance in the Indo-Pacific's security landscape.

Recognizing this, India is set to launch three major undersea cable initiatives—2Africa Pearls, India-Asia-Express (IAX), and India-Europe-Express (IEX)—which will not only quadruple its internet capacity but also solidify its position as a regional leader in digital infrastructure.[1] These cables will significantly enhance India's ability to facilitate data flow between continents, further integrating it into the global economy and making its security and stability critical to both regional and global stakeholders.

Recent incidents, such as the attacks on the Nord Stream pipelines and the cutting of submarine cables in the Red Sea, have highlighted the vulnerabilities of this infrastructure. Given their immense economic value, disruptions to submarine cables can have far-reaching impacts on internet accessibility and global financial markets. The International Cable Protection Committee (ICPC) has warned that disruptions could lead to significant financial losses,[2] underscoring the urgency of implementing stronger protection measures.

With these vulnerabilities in mind, this chapter explores the structural composition, vulnerabilities, and repair mechanisms of submarine cables. It also reviews the international and Indian legal frameworks currently in place to safeguard, maintain, and repair these cables. The chapter concludes by proposing updates to India's legal framework and examines how a collaborative cable resilience partnership under the Quad—an informal strategic alliance between Australia, India, Japan, and the United States—could enhance the security of undersea cables across the Indo-Pacific region.

Global Importance of Submarine Cables

Submarine telecommunications cables form the backbone of global connectivity, spanning nearly 1.5 million kilometers (km) across the world's oceans. Originally laid during the telegraph era, this

network has since evolved into an indispensable component of the global economy, enabling communication, financial transactions, and the exchange of data. As of June 2024, nearly 1.4 million km of submarine cables are in service worldwide, with more than 600 active or planned systems.[3] These cables carry an estimated $10 trillion in daily financial transactions, underscoring their vital role.[4] For example, the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which serves over 8,300 financial institutions in more than 200 countries, relies heavily on these cables.[5] Thus, disruptions to submarine cables have wide-ranging consequences for global markets, communications, and security. This interconnectedness brings opportunities and challenges, particularly for strategically located nations like India.

India's Geopolitical Role as a Cable Hub

India's strategic location in the Indian Ocean Region places it at the crossroads of critical submarine cable routes, linking regions such as Europe, East Asia, Southeast Asia, and West Asia. With the convergence of major cables in Indian waters, the country's role as a critical nexus for global data flows not only enhances its economic power but also heightens its responsibility to protect these infrastructures from natural and man-made threats. As more submarine cables traverse the Indian waters, positioning it as a pivotal player, the nation's stake in enhancing its resilience against various threats becomes crucial. Any failure to safeguard these networks could disrupt global financial systems, communications, and military operations**,** positioning India as a key player in international stability**.**

India's investment in new submarine cables, such as the 2Africa Pearls and India-Asia-Express (IAX) systems, bolsters its digital economy and geopolitical influence. As these cables strengthen connectivity between continents, India emerges as an indispensable gateway for commercial and strategic data flows. This growing influence requires India not only to manage these systems

domestically but also to lead international efforts to protect them. India's proactive role in initiatives like the Quad solidifies its position as a regional and global leader in securing critical infrastructure. To fully appreciate the complexities of safeguarding these undersea networks, it is essential to understand their technical composition and inherent vulnerabilities.

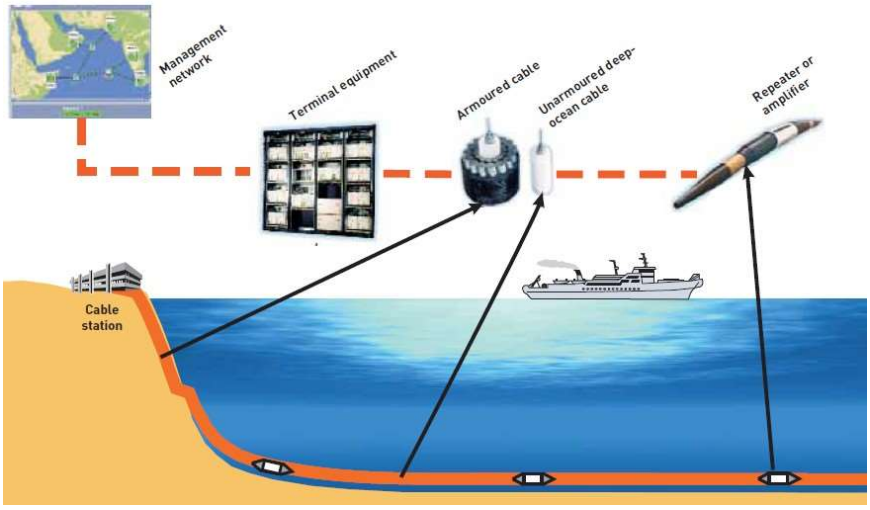

FIGURE 24.1: SUBMARINE CABLE SYSTEM

Source: Fiber Transceiver Solution, "Sumary of Cable System," October 16, 2014, https://www.fiber-optic-transceiver-module.com/essay-about-submarine-cables-system.html/sumary-of-cable-system

Technical Composition of Submarine Cables

The technical composition of submarine cables underscores their vulnerability to both natural forces and human interference, further highlighting the importance of protective measures. Submarine cables consist of fiber-optic strands about the width of a human hair encased in layers of insulation and conductive material. The cable's thickness varies depending on the level of protection required; cables in shallow water are generally thicker and more protected than those in deeper ocean regions. Submarine cables used for power and telecommunications typically range in diameter from 70

millimeters (mm) to over 210 mm.[6] To maintain signal strength, repeaters (amplifiers) are placed along the cable route every 40 km to 80 km.[7] Figure 24.1 illustrates the layered structure of these cables, emphasizing the protection they require.

Ownership and Major Industry Players

The global submarine cable system is primarily developed, owned, and maintained by private-sector companies. As of 2021, about 98% of the world's submarine cables were manufactured and installed by four major firms: SubCom (U.S.), Alcatel Submarine Networks (France), Nippon Electric Company (Japan), and China's HMN Technologies.[8] Alcatel Submarine Networks and Nippon Electric Company collectively dominate the market with an 87% share,[9] while HMN Technologies holds another 11%. Other key players in the market include Nexans (France), Prysmian Group (Italy), NKT A/S (Denmark), Sumitomo Electric Industries (Japan), and LS Cable & System (South Korea).[10]

Major contributors to submarine cable development in India include Tata Communications, Bharat Sanchar Nigam Limited (BSNL), Bharti Airtel, and Reliance Jio. Notably, in recent years, the landscape of submarine cable ownership has shifted,[11] with tech giants such as Amazon, Google, Meta (formerly Facebook), and Microsoft now owning or leasing roughly 50% of global undersea bandwidth capacity.[12] This shift reflects a broader transition in global power dynamics, where control over data flows increasingly equates to economic influence. This influence also brings with it the responsibility to maintain and repair these critical systems, a task that presents significant technical and financial challenges.

Repair Mechanisms and Challenges

Laying submarine cables is a highly expensive process, with costs ranging from $30,000 to $50,000 per kilometer,[13] depending on factors such as water depth, cable type, and seabed topography. The

complexity of this process has resulted in a market dominated by a few major players with specialized expertise. Repairing submarine cables, especially deep underwater ones, is complex and requires specialized ships and equipment. In addition to that, maintenance and repair of submarine cables can be quite expensive. For example, repairing a damaged cable can cost between $1 million and $3 million.[14]

Given the critical nature of these systems, the global capacity for cable repair is concentrated in a few countries with specialized resources and specialized ships. Nations such as France, Japan, Singapore, the United Arab Emirates, the United States, and the United Kingdom lead the field in submarine cable repair operations,[15] as detailed in Table 24.1. These countries possess the capability to quickly address issues, ensuring minimal disruption to global data flows.

TABLE 24.1

MAJOR SUBMARINE CABLE SHIPS OPERATING IN THE WORLD TODAY

Country of Registration	Base Port	Cable Ship Name
France	Worldwide	Ile de Batz, Ile de Brehat, Ile de Sein
	La Seyne sur Mer, France	Raymond Croze, René Descartes
	Calais, France	Ile d'Aix
	Cape Town	Léon Thévenin
	Mindelo, Cape Verde	Peter Faber
	Brest, France	Pierre de Fermat
Indonesia	Jakarta, Indonesia	Ile de Re, Teneo, Wave Venture
	Batam, Malaysia	Cable Empowered
Japan	Yokohama, Japan	KDD Ocean Lin, Subaru

	Moji Port, Kita-Kyushu, Japan	KDD Pacific Link
	Worldwide	KDDI Cable Infinity
Marshall Islands	Baltimore, MD, USA	Decisive, Dependable, Durable, Responder
	Noumea, New Caledonia	Reliance
	Taichung, Taiwan	Resolute
United Arab Emirates	Abu Dhabi, UAE	CS Maram, CS Wasel, Etisalat, Niwa, Umm Al Anber
United Kingdom	Worldwide	Cable Innovator
	Portland, UK	CS Global Symphony, CS Recorder, Sovereign
	Curacao, Netherlands	Wave Sentinel
United States	Portland, Oregon, USA	Global Sentinel
Singapore	Colombo, Sri Lanka	ASEAN Explorer
	Singapore	ASEAN Protector, ASEAN Restorer
	Batangas, Philippines	Cable Retriever
Antigua and Barbuda	Worldwide	MV Aniek, MV Layla, MV Lida
Malaysia	Port Klang, Malaysia	Cable Orchestra
	Keelung, Taiwan	Lodbrog
Philippines	Manila, Philippines	PLDT

Source: International Cable Protection Committee. "Publications," updated August 14, 2024, https://www.iscpc.org/publications/.

While countries like Indonesia, Malaysia, and the Philippines have developed some level of cable repair capability, India currently does not possess any cable repair vessels that are Indian-flagged, owned, or stationed domestically. The lack of a dedicated cable repair fleet presents a significant vulnerability. Delays in repairs could impact both domestic and global communications and financial transactions, threatening not only India's economic stability but also its influence in the Indo-Pacific. This vulnerability highlights a broader challenge: the inherent fragility of submarine cable infrastructure in a world increasingly reliant on seamless data transmission.

Vulnerabilities in Submarine Cable Infrastructure

In today's interconnected world, real-time communication across vast distances is the norm, supported by the internet and globalized technology. However, the exponential rise in data transmission has exposed submarine cables to various vulnerabilities. These cables, responsible for carrying nearly all international data, are at risk from both accidental damage and deliberate acts of sabotage.

While natural events like underwater earthquakes can cause significant damage, the International Cable Protection Committee (ICPC) reports that most cable damage is unintentional and stems from human activities, particularly anchoring and fishing. Techniques that disturb the seafloor—such as bottom trawling and dredging—along with anchoring accidents account for nearly two-thirds of the estimated 150 to 200 subsea cable faults that occur each year.[16] Additionally, cable landing stations and areas where multiple cables converge are particularly vulnerable to damage from fishing gear and anchors, creating concentrated points of risk.

Man-made threats, including sabotage and espionage, pose an even more severe challenge. Deliberate damage to submarine cables can result in widespread disruption to communication networks, financial markets, and military operations.[17] For instance, in

November 2007, a cable in Bangladesh was deliberately sabotaged, leading to a complete loss of communications for over a week.[18]

State actors may also target submarine cables as part of "gray-zone conflicts" to achieve military or political objectives without engaging in open conflict. In March 2007, hostile activities by vessels in the South China Sea led to the removal of substantial sections of undersea cables. The Thailand, Vietnam, and Hong Kong (TVH) system and the Asia Pacific Cable Network (APCN) were severely affected, with 98 km of cable taken from the TVH system and 79 km from the APCN system.[19] More recently, aggressive maneuvers by Chinese ships in the South China Sea and the East China Sea have increased the risks to undersea cables, with Chinese vessels accused of disrupting cables connecting Matsu, a group of islands, to Taiwan's main island.[20]

One of the most critical vulnerabilities arises from the limited route diversity in undersea cable networks. Due to financial constraints, seabed topography, and the strategic location of landing stations, many cables converge at specific points, creating choke points that are particularly susceptible to disruption. For example, in June 2022, a section of the Asia-Africa-Europe-1 (AAE-1) cable was severed, affecting millions of people across multiple countries. The cascading impact extended beyond the AAE-1 cable, demonstrating the broad disruptions that a single break can trigger. Given the complexity of repairing submarine cables and the fact that only a few countries possess the necessary resources and technology for repairs, these incidents are challenging and often delayed, further compounding their impact. These challenges underscore the need for international cooperation and legal frameworks to protect submarine cable infrastructure.

International Laws

The international legal framework for submarine cables began with the International Convention for the Protection of Submarine

Telegraph Cables, commonly known as the Paris Convention. Finalized on March 14, 1884, this agreement was the first to establish a regulatory structure aimed at safeguarding submerged cables on the ocean floor.[21] The Paris Convention laid out specific provisions for cable protection beyond national jurisdiction,[22] including:

- *ARTICLE I*: The convention applies *"*outside territorial waters to all legally established submarine cables landed on the territories, colonies, or possessions of one or more of the High Contracting Parties."
- *ARTICLE II:* It is a punishable offense to "break or injure a submarine cable willfully or by culpable negligence, in such a manner as might interrupt or obstruct telegraphic communications, either wholly or partially."
- *ARTICLE IV*: A cable owner who, while "laying or repairing [their] cable, [damages] another cable, must bear the cost of repairing the breakage."
- *ARTICLE VII*: Ship or vessel owners who sacrifice an anchor, net, or other fishing gear to avoid damaging a submarine cable are entitled to "compensation from the owner of the cable."

Evaluation of Legal Frameworks

Despite the progress introduced by the Paris Convention, its limitations—particularly the absence of wartime protection—led to the development of additional legal frameworks. One of the most important is the United Nations Convention on the Law of the Sea (UNCLOS).[23] Preceded by the 1958 Geneva Convention on the High Seas, UNCLOS, finalized in 1982, codified key principles governing international waters and provided broader legal protections for submarine cables.[24] UNCLOS remains the primary

legal instrument governing the use of oceans, including the protection of undersea cables.

United Nations Resolutions

Additionally, recognizing the growing importance of submarine cables as critical information infrastructure, several United Nations General Assembly (UNGA) resolutions have addressed the need for enhanced protection:

- *UNGA RESOLUTION 58/199 (2002):* This resolution emphasized the creation of a global culture of cybersecurity and the protection of critical information infrastructure, including submarine cables.[25]
- *UNGA RESOLUTION 66/231(2011)*: This resolution reiterated the importance of protecting submarine cables as part of critical global infrastructure.[26]
- *UN OFFICE ON DRUGS AND CRIME (UNDOC) EXPERTS MEETING* in 2019 highlighted criminal threats to submarine cables, including sabotage, and called for greater international cooperation to prevent such activities.[27]

Gaps in International Law

However, significant gaps remain in the international legal framework for submarine cable protection:

- *NON-STATE ACTORS*: Current international law does not adequately hold non-state actors—such as terrorist groups or private entities—accountable for sabotaging submarine cables.
- *ECONOMIC LOSSES*: Existing frameworks do not sufficiently address the financial costs of repairing damaged cables or the economic losses caused by disruptions in connectivity.[28]

- *JURISDICTIONAL CHALLENGES*: International law lacks clear provisions for prosecuting non-state actors who damage submarine cables when the perpetrators operate from a country different from where the damage occurred.[29]

These gaps in international law underscore the need for individual nations to develop comprehensive domestic legal frameworks to safeguard their critical submarine infrastructure. India, with its growing reliance on undersea cables and its strategic position in the Indo-Pacific, exemplifies this need.

Submarine Cable Networks and Legal Provisions in India

India's prominence as a key hub for submarine cable networks is rooted in its strategic location in the Indian Ocean Region and its efforts to drive digital transformation through initiatives like *Digital India*. Submarine cables, forming the backbone of global communication and data exchange, are vital for India's economic growth and national security. The rapid expansion of India's submarine cable infrastructure—through projects like 2Africa Pearls and the India-Asia-Express (IAX)—has positioned the country as an increasingly important player in the global data network.

With its growing domestic and international cable infrastructure, India must address critical vulnerabilities such as the lack of domestic cable repair capabilities. Similarly, developing a strong legal framework for governing these networks and the geopolitical importance of securing these assets is particularly crucial as the nation navigates rising tensions in the Indo-Pacific region. To fully grasp the scale of this challenge, it is important to understand the extent of India's submarine cable network.

India's Cable Network

As of the end of 2022, the Telecom Regulatory Authority of India (TRAI) reported that India had 17 international subsea cables,

landing at 14 distinct cable landing stations across five cities—Mumbai, Chennai, Cochin, Tuticorin, and Trivandrum.[30] In addition to international cables, India operates domestic submarine cables, including developing cable connections with the two islands. Notable examples include:

- *CHENNAI-ANDAMAN AND NICOBAR ISLAND CABLE (CANI):* Connecting Port Blair to seven other islands in the Andaman & Nicobar archipelago.
- *KOCHI-LAKSHADWEEP ISLAND (KLI) CABLE:* Providing a direct communication link between Kochi and 11 islands in Lakshadweep.[31]

India's submarine cable network is undergoing significant expansion. Between March 2023 and March 2024, TRAI reported an 8.3% growth in internet subscribers, from 881.25 million to 954.4 million.[32] Key players driving this expansion include Tata Communications, which operates the world's first round-the-world fiber-optic cable network, the Tata Global Network–Eurasia (TGN-EA).[33] Reliance Jio is also rapidly expanding its footprint, leading the development of both the India-Europe-Xpress (IEX) and India-Asia-Xpress (IAX) projects.[34]

Additionally, BSNL is also involved in enhancing India's international connectivity. BSNL operates its first international submarine cable connecting India and Sri Lanka (BLCS) and manages a cable landing station in Tuticorin. The company also constructed the Chennai-Andaman & Nicobar Islands (A&N Islands) submarine cable system.[35] These efforts by BSNL, along with initiatives from other major players, contribute to India's rapidly growing prominence in the global submarine cable network. Figure 24.2 illustrates the global submarine cable network, showcasing critical routes and India's strategic position.

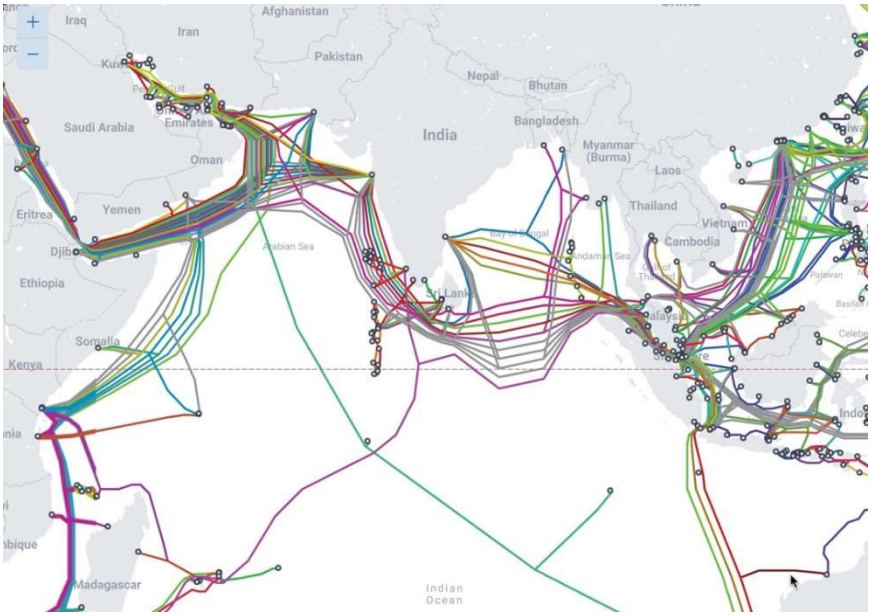

FIGURE 24.2: SUBMARINE CABLE MAP

Source: TeleGeography, "Submarine Cable Map," https://www.submarinecablemap.com/

Expanding India's Submarine Cable Infrastructure

India is rapidly emerging as a crucial hub for submarine cable infrastructure, a vital element of the *Digital India* initiative to

transform the country into a digitally empowered society and knowledge economy. Recent announcements of three major submarine cable projects are expected to enhance this infrastructure:

- *2AFRICA PEARLS*: One of the world's longest submarine cable systems, spanning more than 45,000 km with a capacity of 180 terabits per second (TBps), connecting 33 countries, including a landing station in Mumbai.
- *INDIA-ASIA-EXPRESS (IAX) AND INDIA-EUROPE-EXPRESS (IEX):* Developed by Reliance Jio, these cables will add over 200 TBps each. IAX will stretch over 16,000 km, linking Mumbai to Southeast Asian hubs such as Singapore, Malaysia, Thailand, and Sri Lanka. While IEX will cover approximately 9,775 km, connecting India to Europe via the Persian Gulf.[36]

These cables are expected to strengthen India's strategic position in the Indo-Pacific, support the country's broader "Act East" policy, and make it a key player in global data transmission. To ensure the secure and efficient operation of this expanding network, a robust legal and regulatory framework is essential.

Legal and Regulatory Frameworks Governing Submarine Cables in India

India's submarine cable infrastructure is regulated by several key legislative acts:

- *THE MARITIME ZONES OF INDIA ACT OF 1976:* Provides the legal framework for laying underwater cables within India's maritime zones.
- *THE TELECOMMUNICATIONS ACT OF 2023:* Replacing the Indian Telegraph Act of 1885, this act defines submarine cable systems, particularly those connecting India internationally.[37]

- *THE INFORMATION TECHNOLOGY ACT OF 2000 AND THE SUPPRESSION OF UNLAWFUL ACTS AGAINST SAFETY OF MARITIME NAVIGATION AND FIXED PLATFORMS ON CONTINENTAL SHELF ACT OF 2002:* Used for legal actions against damages to submarine cables, though their application remains complex and limited.[38]

Despite these frameworks, India's legislation lacks a comprehensive definition of submarine cable systems, complicating regulatory oversight and enforcement. The modern complexities of these systems are not fully addressed in existing laws, leaving vulnerabilities in protection and management, including a critical gap in domestic cable repair capabilities.

Cable Vulnerabilities and Lack of Domestic Repair Fleet: A Critical Challenge for India

India's submarine cable infrastructure remains vulnerable due to several factors, most notably the lack of dedicated domestic cable repair vessels. As detailed in Table 24.1, India does not possess any flagged or domestically stationed repair ships, leading to potential delays in addressing disruptions.[39] This gap became apparent in January 2008, when multiple undersea cables were severed off the coast of Egypt and Dubai, causing the catastrophic loss of over 80% of India's international internet service and affecting approximately 60 million users for over two weeks.[40]

The potential sabotage of cable landing stations in key cities like Mumbai, Chennai, and Kochi poses additional risks. Any disruption could have severe consequences for communication networks and national security. As India's strategic location in the Indian Ocean becomes central to the data flow, this gap exposes it to significant risks and could be severely undermined by its inability to promptly repair damaged cables.

Therefore, addressing this deficiency should be a top priority in India's broader submarine cable strategy. A proactive approach—

investing in specialized repair ships, technology transfer, and collaboration with international partners—would ensure the uninterrupted flow of data essential for the global economy. Developing domestic repair capabilities would also reinforce India's position as a reliable and resilient hub in the global data network. However, India's efforts to secure its cable infrastructure must also consider the increasingly complex geopolitical landscape.

Geopolitical Tensions and Strategic Importance

With rising geopolitical tensions in the Indo-Pacific, submarine cables are becoming focal points of international cooperation. As countries vie for influence in the region, ensuring the security and resilience of these cables has become a focal priority, particularly within the context of frameworks like the Quad. Strengthening collaboration on cable security within such frameworks could provide a solution to many of India's existing vulnerabilities. Building on this understanding of the challenges and opportunities, India must adopt a proactive and comprehensive strategy to safeguard its submarine cable infrastructure.

Strategic Path Forward: Enhancing Submarine Cable Security in India

India's strategic location in the Indian Ocean Region makes it a vital hub for submarine cables, linking regions such as Europe, East Asia, Southeast Asia, and West Asia. These cables are indispensable for data transmission, forming the backbone of modern economies and military communications.

Recognizing the significance of submarine cables, TRAI issued recommendations in June 2023 on the "Licensing Framework and Regulatory Mechanism for Submarine Cable Landing in India."[41] The recommendations proposed classifying submarine cables and Cable Landing Stations (CLS) as "Essential Services," granting them higher protection and prioritization under national regulations.

While this is an important first step, a more structured and multi-layered approach is necessary to address the range of challenges India faces in safeguarding its undersea infrastructure.

Strategic Recommendations for Enhancing Submarine Cable Security

To ensure the resilience and security of its submarine cable infrastructure, India must adopt a comprehensive strategy that addresses both immediate vulnerabilities and sets the groundwork for future challenges. This strategy should prioritize legal reforms, international collaboration, and domestic capacity-building to protect this critical asset. The following recommendations are divided into immediate, medium-term, and long-term actions, offering a roadmap for India to enhance its cable security while strengthening its role as a global hub in the Indo-Pacific region.

Immediate actions:

1. *Classify Submarine Cables as Critical Infrastructure:* Designate submarine cables and landing stations as critical infrastructure under the Information Technology Act (IT Act) 2000 and integrate them into the Critical Information Infrastructure (CII) framework. This will ensure accelerated legal protections, enabling authorities to swiftly prosecute individuals or entities that damage or threaten these vital assets.
2. *Expand International Partnerships:* Beyond the Quad, India should engage with the Association of Southeast Asian Nations (ASEAN), the European Union, and key private-sector payers like Google, Amazon, Meta, and Microsoft. These tech giants control a significant portion of global undersea bandwidth and could provide co-investment opportunities, technological expertise, and collaborative security efforts. Expanding international collaboration will

support a holistic approach to cable resilience and protection.

3. *Develop Domestic Solutions for Cable Maintenance and Repair:* Prioritize the development of Indian-flagged vessels dedicated to submarine cable maintenance and repair to reduce reliance on foreign capabilities. Implement tailored security measures for Cable Landing Stations (CLS) by categorizing them as Main CLS or CLS Point of Presence (CLS-PoPs) based on their vulnerabilities, ensuring faster response times in case of disruptions.
4. *Establish a National Critical Information Infrastructure Protection Centre (NCIIPC):* Create an NCIIPC tasked with overseeing the security of submarine cables and managing the extra-territorial application of Indian law. This center would address emerging vulnerabilities in modern submarine cables and coordinate efforts to enhance their security across domestic and international jurisdictions.[42]

Medium-term actions:

5. *Establishing Cable Protection Zones within India's EEZ:* Adopt best practices from countries like Australia by establishing Cable Protection Zones within India's Exclusive Economic Zone (EEZ). These zones would restrict high-risk activities such as fishing, anchoring, and dredging, which could damage submarine cables. Aligning these efforts with UNCLOS will further India's commitment to international marine security norms.
6. *Strengthening Engagement with the International Cable Protection Committee (ICPC):* Increase India's involvement with the ICPC to ensure that Indian interests are represented in international discussions on cable protection. While currently represented only by Tata Communications,

India's government and relevant ministries should take an active role in the ICPC to contribute to the development of global standards for cable security.[43]

7. *ENHANCING MULTILATERAL COOPERATION THROUGH THE QUAD AND ASEAN:* Leverage the Quad Partnership for Cable Connectivity and Resilience by deepening its collaboration with the Cable Connectivity and Resilience Centre (CCRC),[44] an Australian government initiative focused on improving undersea cable governance.[45] Additionally, the ASEAN ICT Masterplan 2020 emphasizes regional cooperation for cable resilience and repair and serves as a valuable model for India's multilateral engagements, particularly in streamlining processes and adopting best practices.[46]

Long-term actions:

8. *BUILDING A DEDICATED DOMESTIC CABLE REPAIR FLEET:* Invest in the development of a dedicated Indian-flagged fleet for cable repair operations. This will reduce response times to disruptions and enhance India's capacity to manage and protect its growing submarine cable network, solidifying India's position as a reliable global connectivity hub.

By pursuing these multifaceted strategies, India can proactively safeguard its submarine cable infrastructure, ensuring the uninterrupted flow of information vital for its economic prosperity and national security. This proactive approach will not only enhance India's domestic resilience but also its role as a responsible stakeholder in the global effort to protect this critical infrastructure.

Conclusion

Though submarine cables have existed for over 200 years, serious discussions about their protection have only recently gained prominence due to their growing strategic importance in an

increasingly interconnected world. As the backbone of global data transmission, these cables are indispensable to the functioning of economies, financial systems, and military communications. With over 95% of international data flowing through submarine cables, ensuring their security is critical to maintaining the stability of both national and international infrastructure.

As India emerges as a pivotal hub in the Indo-Pacific's submarine cable network, the country must prioritize the protection and resilience of these cables. The expansion of India's digital infrastructure through new projects underscores the country's growing role in global connectivity. However, this also makes India a key player in the security of these essential infrastructures.

Implementing robust security measures, such as classifying submarine cables as critical infrastructure and increasing cooperation with international partners through frameworks like the Quad and ASEAN, will be essential to safeguarding this critical component of India's connectivity. Additionally, investing in domestic repair capabilities and enhancing legal protections will allow India to respond swiftly and effectively to any potential disruptions.

In conclusion, safeguarding submarine cables is vital for India's economic stability, national security, and defense communications. As the digital economy continues to grow and geopolitical tensions persist in the Indo-Pacific, India must take decisive action to protect these cables, ensuring the resilience of its digital infrastructure and reinforcing its position as a leader in global connectivity.

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