

## Hybrid Threats to the Maritime Infrastructure of Pakistan

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### Abstract

*During a period of poly crisis, Pakistan has been trying to rebuild its economic infrastructure through the second phase of China-Pakistan Economic Corridor. But the lack of operationalization of Gwadar Port has raised eyebrows on Pakistan's Maritime infrastructure which is primarily centered in or on Karachi. The overreliance on Karachi is of considerable concern due to cyber-attacks and maritime terrorism utilizing unscrewed ground, aerial and surface vehicles by VNSAs and VEOs. This paper endeavours to understand the various facets of Pakistan's MIS via the model presented by Beugler and Liebetrau while highlighting the hybrid threats being faced in the context of the prevailing environment. The study explains the various factors that are contributing to the rise in hybrid threats by hybrid actors and proposes a plan to develop redundancies and resilience within the system so as to ensure development of multi domain security architecture.*

**Keywords:** *Hybrid threats, Maritime Infrastructure, Socio-Economic conditions, Redundancies, Security Architecture*

### 1. Introduction

The sabotage of Nord Stream gas pipelines bringing gas to Europe from Russia was a clandestine operation planned in secrecy and conducted with audacity and fearlessness. The executors of the plan successfully planted and detonated explosives in the cold, frigid waters at a depth of around 80-100m in the Baltic Sea. Whoever ordered the hit may ultimately remain elusive, but the hybridity of the attack is unmistakeable. The pipelines are owned jointly by Russian and European companies, passing through international waters in the exclusive economic zones of Denmark and Sweden with Germany being the main recipient of gas. Nevertheless, the perpetrators found a serious lapse in the overall security architecture. The pipelines may be repaired in the future once the Russia-Ukraine conflict is over, but its impact has been remarkable and unmistakable.

NATO remains understandably miffed even today with the numerous claims of attacks or unintentional damage to undersea architecture in the Baltic Sea. It has been forced to launch 'Baltic Sentry', an exercise comprising naval units from Finland, Estonia, Denmark, Germany, Latvia, Lithuania, Poland and Sweden to cater for the threats posed to the undersea architecture primarily power cables and communication cables (*NATO Launches 'Baltic Sentry' to Increase Critical*

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*Infrastructure Security*, 2025). But these threats are not limited to Baltic Sea only. UAVs and USVs have been regularly used by non-state actors and state proxies in Red Sea to challenge Israel bound shipping as a counter measure to Israeli genocidal actions in Gaza Strip. Even warships have become targets to drone attacks in Black Sea as well as Red Sea. This indicates a wide range of threats where the perpetrator is not clearly identifiable.

Pakistan has been under the onslaught of hybrid threats for the past decade or so. Cross border terrorism, economic coercion, neighbourhood bullying, cross border support of assassinations of key political leaders, disinformation campaigns are just some of the facets of hybrid threats that Pakistan has faced. Even though Pakistan cooperated with USA in its withdrawal from Afghanistan, the situation in Afghanistan has created a security situation within Pakistan, where terrorism is on the rise and patience between the two neighbours is running low. Despite multiple efforts, the situation has worsened and terrorist attacks on security forces have increased considerably (Hussain, 2025). Considering Pakistan's imports and exports which are greatly reliant on its seaports and associated maritime infrastructure (MIS) is primarily located in and around Karachi, the economic heartland of the country. This paper aims to identify the critical nodes of Pakistan's MIS while identifying the hybrid threats and the factors that exacerbate these threats to Pakistan's maritime infrastructure in the current scenario. The paper will also discuss response options exercised by Pakistan and suggests a way forward.

## **2. Definitional standpoint**

NATO identifies 'Hybrid Threats' as "*military and non-military as well as covert and overt means, including disinformation, cyber-attacks, economic pressure, deployment of irregular armed groups and use of regular forces*". This is similar to the definition given by American Frank Hoffman who had described the 'Hybrid Warfare' as "*the blurring of modes of war, the blurring of who fights and what technologies are brought to bear, produces a wide range of variety and complexity*" (Mattis & Hoffman, 2005). According to Hoffman, Hybrid threats "*incorporate a full range of different modes of warfare including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorder*" (Hoffman, 2007). Brin Najzer has defined Hybrid warfare as "*a distinct form of low-level conflict spanning the spectrum of capabilities.*" He further explained it as a "*blend of conventional and unconventional which enables the actor to exploit an opponent's strategic or doctrinal weakness while maintaining deniability and strategic surprise*" (Najzer, 2020). The annexation of Crimea by Russia in 2014 has been classically labelled as 'hybrid warfare' by the western academicians where without conducting any conventional operation, the Russians successfully annexed a territory from Ukraine. There is a subtle difference between hybrid threats as proposed by NATO and hybrid warfare as used mostly in literary writings. For the purposes of this paper, **hybrid threats will be examined within the definitional framework given by NATO.**

### 3. Pakistan's Maritime Infrastructure (MIS)

The maritime sector makes significant contributions to the world's economy and despite the unfavourable geo-political environment, the maritime sector has continued to expand providing valuable income to coastal states. United Nations Conference on Trade and Development (UNCTAD) has projected maritime trade to increase by an average annual rate of 2.4% between 2025 and 2029 (UNCTAD Review of Maritime Transport 2024 - Navigating Maritime Chokepoints, 2024). The success of the maritime sector depends not just on merchant ships plying the world's oceans but also on the development of infrastructure to support the merchant fleet bringing in and taking out vital cargo. Bueger and Liebetrau have covered the definition of Maritime Infrastructure (MIS) very aptly in the picture above which covers the five major facets of MIS with its linkages on the sea, in the sea and at sea (Bueger & Liebetrau, 2023). Pakistan despite having a coastline of 1001 km has very limited MIS despite almost all its trade going through sea. In order to better assimilate the construct of Pakistan's MIS, Beugger and Liebetrau model will be taken as a baseline for this study.

**Figure 1: Beugger and Liebetrau Model**

		On the sea	In the sea	On land
	<b>Transport</b>	Ships, shipping lanes,	Emissions	Ports
	<b>Energy</b>	Platforms	Platforms, electricity cables, pipelines	Ports, landing stations, repair facilities
	<b>Communication</b>	Repair ships	Data Cables	Landing stations, repair facilities
	<b>Fishery</b>	Ships, fishing zones	Fishing gear, aquaculture	Ports, aquaculture
	<b>Eco-systems</b>	Biodiversity	Biodiversity, carbon sink, carbon storage	Coastal areas, beaches

**3.1. Transport.** Pakistan's trade is almost completely from the maritime routes with land routes serving its neighbouring countries Iran, Afghanistan and China (*Economic Survey of Pakistan 2023-24*, 2024). Almost all its imports and exports through sea are handled by its sister ports at Karachi i.e. Karachi Port (KPT) and Port Qasim (PQ).

**Table 1: Compiled by Author**

Transport			
Factor	On the Sea	In the Sea	On land
Relevant Detail	Pakistan National Shipping Corporation (PNSC)	Emissions –	Karachi Port Port Qasim Gwadar Port
Remarks	10 ships – lifting only 10-11% of its international trade	Negligible impact	Gwadar Port yet to be fully operationalized

3.1.1. During the year 2022-23, Pakistan's total seaborne trade stood at 82.913 million tonnes, out of which Port Qasim handled 40.5 million tonnes cargo which amounts over to 48.85% of total trade. KPT handled 41.851 million tonnes (50.47%) and Gwadar port share remained 0.562 million tonnes (0.68%) (Ministry of Maritime Affairs Year Book 2022-23, 2023).

**Table 2: Compiled by Author**

Port Statistics			
Trade	Fiscal Year	Karachi Port (in million tons)	Port Qasim (in million tons)
Imports	2021-22	35.540	46.665
	2022-23	29.075	33.382
	2023-24 (Jul- Mar)	40.844	26.892
Exports	2021-22	16.169	8.485
	2022-23	12.776	7.118
	2023-24 (Jul- Mar)	23.301	7.352

3.1.2. Pakistan National Shipping Corporation (PNSC) is a state owned enterprise that presently owns 10 merchant ships under its inventory with a total deadweight tonnage carrying capacity of about 700,000 metric tons. Although the company has been in profit, it carries a paltry amount of cargo as the numbers show below. Pakistan unfortunately also fails to lift the permissible 40% of cargo allowed under United Nations Liner Code 1974. This permissible cargo can go up to 60% without any contravention to the law. Despite a very small fleet, it has taken steps to follow International Maritime Organization (IMO) guidelines on greenhouse gas emissions and has developed a Ship Energy Efficiency Measurement Plan (SEEMP) for its fleet. It has also installed the Carbon Intensity Indicator (CII) and Energy Efficiency

Existing Ship Index (EEXI) on its vessels to reduce carbon emissions (PNSC CSR Report 2024, 2024).

**Table 3: Compiled by Author**

Comparison Sector wise Cargo (2022 & 2023 – in million tons) (Ministry of Maritime Affairs Year Book 2022-23, 2023)						
	Dry Bulk		Liquid bulk		Total	
	2022	2023	2022	2023	2022	2023
Pakistan's seaborne trade	70.72	54.13	36.096	28.80	106.8	82.95
PNSC Share	1.316	1.57	10.655	9.26	11.97	10.83

**3.2. Energy:** Pakistan is an importer of petroleum products. Almost all its demands are met through imports primarily from Gulf countries as depicted in the table below. This heavy reliance on imports is further magnified as Pakistan cannot import crude oil or natural gas from its neighbour Iran for the fear of American sanctions. Also, there are no pipeline flowing into Pakistan from any neighbouring state or from the sea. Despite efforts by Pakistani government in 2019 to find oil and gas in its offshore exploration area Kekra-1 through a consortium of companies, the efforts failed and the well was plugged. The import of Liquified Natural Gas (LNG) to fulfil local demands which has risen from 632 mmcfd (million cubic feet per day) from the period of Jul-Mar 2023 to 695 mmcfd in Jul-Mar 2024 time is also a heavy load on the national exchequer. The shortage of gas has forced Pakistan to establish two RLNG terminals at Port Qasim to fulfil the domestic demand for gas. The absolute reliance is on merchant ships (oilers and LNG carriers) bringing in oil and LNG to its ports at Karachi (table 4 below) (*Economic Survey of Pakistan 2023-24*, 2024). There are no offshore wind energy farms and neither is there any import of electricity through any sea route with underwater power cables.

**Table 4: Import of Petroleum Products**

Period/ Product	FY2023		July-March FY2023		July-March FY2024	
	Quantity	Value (C&F)	Quantity	Value (C&F)	Quantity	Value (C&F)
MS	5,181.04	4,829.87	3,853.99	3,704.34	3,528.13	3,156.31
Crude Oil	7,595.47	5,334.17	5,858.44	4287.35	6,169.27	4,051.07
HOBC	31.57	30.57	18.05	18.54	17.83	16.25
HSD	2,367.03	2,219.08	1,645.59	1,646.31	1,233.53	1,050.27
FO	530.59	307.66	530.59	307.20	-	-
JP-1	113.94	100.68	70.06	65.65	98.24	85.51
<b>Total</b>	<b>15,819.63</b>	<b>12,822.03</b>	<b>11,976.73</b>	<b>10,029.39</b>	<b>11,047.00</b>	<b>8,359.41</b>

**Note 1** All values in US\$, quantity in thousand MT

3.2.1. Pakistan's oil imports are primarily offloaded at Karachi Port and Port Qasim and most of the oil storage depots are located within or close to Port area. The Oil Companies Advisory Council in its 2018-19 report had reported that three oil piers at KPT handled close to 12.4 Million MT through 269 vessels of crude oil and petroleum products in FY 2018-19. During the same period, Port Qasim handled around 4.2 Million MT with 102 vessels while the average size of the tankers at the two ports remained around 47,000 MT (*Pakistan Oil Report 2018-2019*, 2019). The report identified that the total storage capacity of terminals at Karachi Port and Port Qasim is around 1,181,596 million tons.

3.2.2. Cneryico's Single Point mooring located at Mouza Kund in Baluchistan is the only off shore jetty in the country, that allows mooring of oil tankers for offloading their cargo into the storage tanks off shore. The storage tanks with a capacity of 130000 metric tons are connected to the SPM via an on shore-offshore pipeline. This allows large oil tankers to offload their cargo without entering Karachi Port or Port Qasim. A similar jetty has been developed by China Power Hub Generation Company (CPHGC) to offload imported coal for its 1320 MW Power Plant located in the coastal city of Hub in Baluchistan.

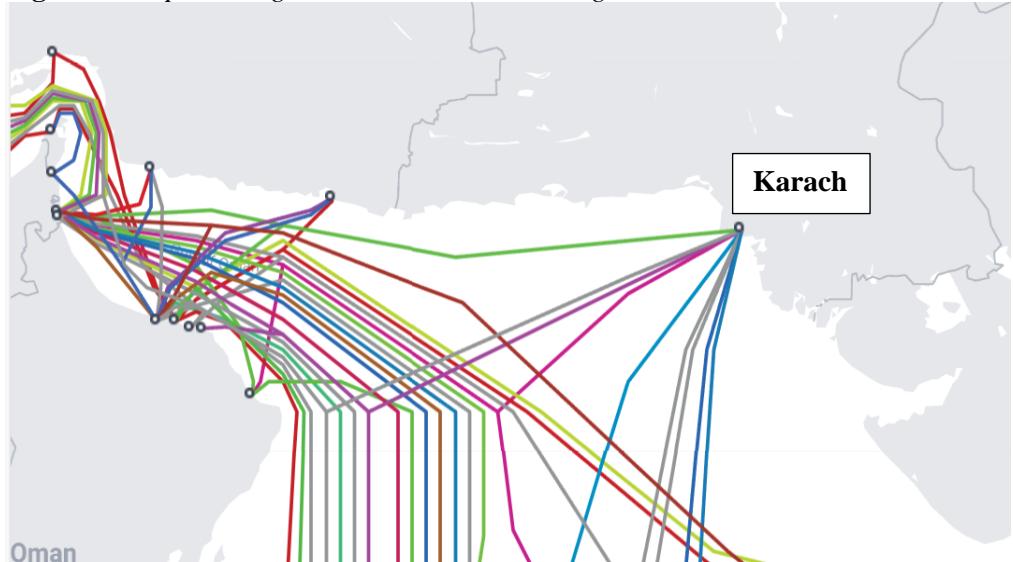
**3.3. Communication:** Pakistan although has land borders on north, east and west but only has one land based optical fibre cable (OFC) entering from a neighbouring country. This is part of the CPEC Fiber Optic Project which is a 820 km fibre optic cable connecting Khunjerab on Pak-China border to the garrison city of Rawalpindi. This OFC establishes a link between Pakistan and Trans-Asia Europe cable in China, which provides alternative routes for international connectivity to both Pakistan and China (Rauf, 2019). Other than this, Pakistan is heavily reliant on six submarine cables which are all landing at port city of Karachi. This heavy reliance means any disruption to submarine cables entering Pakistan could translate into heavy losses for its IT industry as well as its financial sector. It is pertinent to mention that there are around 60 cable laying ships operating in the world and limited deliveries of new ships are considered a serious bottle neck considering the threat to submarine cables and its importance to global telecommunication network (Swinhoe, 2022).

**Table 5:** Compiled by Author

<b>Pakistan Submarine Cables</b>	
Submarine Cable	Design Capacity
TWA-1 (Transworld Associates)	1.28 Tbps
SEA-ME-WE-3	480 Gbps with two fibre pairs
SEA-ME-WE-4	1.28 Tbps

SEA-ME-WE-5	24 Tbps
I-ME-WE	3.86 Tbps
AAE-1	40 Tbps
2Africa	180 Tbps

**Figure 1:** Map showing Submarine Cables landing at Karachi



**Note:** Image adopted from <https://www.submarinecablemap.com/submarine-cable/asia-connect-cable-1-acc-1>

**3.4. Fisheries:** Pakistan has a coastline of 1001 kms with an Exclusive Economic Zone of 240000 square km with an additional continental shelf of 50000 square kms. The 12 NM territorial waters are administered by the two coastal provinces i.e. Sindh and Baluchistan whereas all waters beyond the territorial waters are administered by the federal government. There are five operational fish harbours in Pakistan that includes Karachi Fish harbour and Korangi fish harbour co located in Karachi. Karachi Fish Harbour is by far the biggest fish harbour of the country and due to lack of facilities in other fish harbours, majority of fish catch brought in by fishermen is landed at Karachi fish harbour. Although services at Korangi fish harbour have improved recently, with more boats using Korangi as home port (Ministry of Maritime Affairs Year Book 2022-23, 2023). But despite this increase in numbers, the true potential of Korangi Fish harbour has yet to be achieved (Abro, 2024). It is pertinent to mention that Korangi fish harbour operates under the auspices of the federal government whereas the Karachi Fish harbour operates under the provincial government of Sindh. In addition to these two fish harbours, fish harbour at Pasni, Gwadar and Jiwani are also being used by fishermen to land their catch. There are numerous fish landing sites in addition to the fish harbours that are used by fishermen. They include

Damb, Sur, Pishukhan, Gaddani, Ibrahim Hyderi, Keti Bander, etc. Ibrahim Hyderi also located within the remit of Karachi, is the largest fish landing site. These fish landing sites lack basic amenities and are normally used by fishermen who go out for short fishing trips and intend selling their catch quickly or to the middlemen. Similarly, Keti Bandar is a small harbour that supports the local economy and is used as a fish harbour for the fishermen of Thatta district and adjoining areas. It is currently situated on the river Indus and is a hub owing to its location near the Arabian Sea and the Hajambro River.

#### **4. Hybrid threats to Pakistan's MIS**

Situation in Baluchistan, the largest province of Pakistan and with a considerable coastline, has also worsened because of the support given to terrorist groups by hostile intelligence agencies (HIAs). Baluchistan is the province that is key to the success of China-Pakistan Economic Corridor as Gwadar Port is located here. The progress on Gwadar Port has been abysmal with very limited port calls by merchant ships. Street protests have broken out on numerous occasions protesting against government inefficiency and poor management. All of this includes an element of outsider involvement in addition to government inept behaviour. The country that gains most out of Gwadar's failure is India and thus India poses the biggest source of hybrid threats to Pakistan's MIS. Thus, it is important to discuss India as a hybrid actor prior to discussing the threats that are posed to Pakistan's MIS.

**4.1. India:** Pakistan's traditional rival has always been India. The relationship has been marred by the dispute over Kashmir and Sir Creek. Three all out wars, multiple skirmishes with the latest one in 2019 culminating in a downing of an Indian Fighter aircraft. This has not stopped India from applying all kinetic and non-kinetic means to destabilize Pakistan. Its leadership has openly threatened to foment trouble inside Pakistani territory (Khetran, 2017). It has through a dedicated disinformation campaign pushed its agenda on Indian Illegally Occupied Jammu and Kashmir (IOJK) and has labelled freedom fighters as terrorists and blamed Pakistan for supporting them (Alaphilippe, et al., 2020). It has undertaken assassinations of Kashmiri leaders who have been striving against Indian illegal occupation of Kashmir (Jamal, 2023). It has supported terrorist groups operating in Pakistan through its consulates in Afghanistan. The capture of Indian Naval officer Kulbhushan Yadav from Baluchistan province is a testament to the fact of Indian involvement in terrorist activities in Pakistan (*Transcript of RAW Agent Kulbhushan's Confessional Statement*, 2016). It has also allegedly provided medical care to terrorist leadership of Baluch separatist groups in India (Bhattacherjee & Haidar, 2021). Economically, it has burdened Pakistan by lobbying for FATF grey listing (Guarav, 2021). India also is suspicious of Pakistan's all-weather friendship with China and has taken every opportunity to take advantage of this situation at all levels of statecraft. Diplomatically, militarily and in the information domain, India has created the fear of China

furthering its influence into the Arabian Sea by furthering the notion of Chinese military deployments at Gwadar Port. This has aligned with the American vision of India's role as a 'Net Security Provider' in the region. This, however, is in contradiction to how Pakistan looks at China's role in Indian Ocean region and with its decade's old enmity with India, Indo-US strategic alignment has become an indirect threat to Pakistan's national security interests.

Pakistan's economic turmoil and instability on its borders creates the perfect environment for India to use all what is under the sky to further weaken Pakistan and embolden its status in the region. In order to do so, India in the maritime domain, has undertaken various steps to threaten Pakistani MIS. The stoppage of a Malta flagged merchant ship at an Indian port carrying a Computer Numerical Control (CNC) machine from an Italian company is a step in the same direction. The Indians alleged that it was dual use technology that may have been used in Pakistan's nuclear and missile program (Syed, 2024). Although Pakistan vehemently refused these allegations, such actions harm Pakistan's maritime interests and confidence of shipping companies for taking cargo to Pakistani ports. This move by the Indians was a very calculated one considering Pakistan has a very small merchant fleet and is almost wholly reliant on international shipping especially when it comes to containerized cargo. Bringing nuclear and missile program into the limelight raises suspicions from western countries despite Pakistan having an independent program for the past many decades. Previously, India has attempted to blame Pakistan by undertaking a false flag operation at sea in 2015 (Shahid & Zeb, 2024). In a more recent incident, India has accepted involvement of Indian citizens in smuggling of illicit drugs 110 NM south of Pakistani coast (Satish Jha, 2024). This is indicative of alleged involvement of trans-national drug syndicates operating at high seas threatening national security.

- 4.2. **Maritime Terrorism** The menace of maritime terrorism has targeted the region and is of special concern to the regional states. The USS Cole incident in 2002 which killed 17 American sailors while the ship was berthed in Aden, Yemen brought the threat of Maritime terrorism to the fore (DoD USS COLE Commission Report, 2001). The USS Cole incident was a suicide bombing with two bomb laden boats smashing the hull of the ship. The advent of technology has allowed for the suicide boats to be remotely controlled commonly known as Uncrewed Surface Vessels (USVs) as was seen in the targeting of Saudi Frigate Al Madinah in 2017 (LaGrone, 2017). The use of UAVs and USVs has increased considerably with the targeting of merchant ships by non-state actors and state sponsored proxies. The UAVs are being used as 'loitering munitions' with Satellite guidance and are homing on their target utilizing the Automatic identification system (AIS) data being

transmitted by target merchant ships (Loitering Munitions – The Threat to Merchant Ships, 2023).

Pakistan has not been greatly afflicted by the scourge of maritime terrorism but Mumbai attacks in India in 2008 and attack on its Naval Air Base PNS Mehran in 2011 shifted the focus on protecting its MIS from any terrorist threat. Pakistan has generally been successful in preventing any direct terrorist threat to its MIS but the availability of commercially available drone technologies to the terrorists is a considerable threat to MIS. They can be used to target merchant ships not just in open sea but also when entering/leaving or berthed in harbour. They have the potential to cause considerable damage when used to target oil storage depots or refineries located in and around Karachi Port and Port Qasim. Similar attacks have been undertaken by Houthis when they targeted oil processing facilities located at Abqaiq and Khurais in eastern Saudi Arabia in 2019 (*Houthi Drone Attacks on 2 Saudi Aramco Oil Facilities Spark Fires*, 2019).

Pakistan's submarine cables and its related infrastructure are also under consistent threat of maritime terrorism. Pakistan's heavy reliance on submarine cables for its telecommunication data and internet services means their importance has multiplied in light of the threats posed to the submarine cable in Baltic Sea. Any disruption would be a major blow to Pakistan's IT, manufacturing and banking sector as well as create undue social disorder. The fact that most of the submarine cables land in Karachi is another factor that multiplies the threat. Although damaging submarine cables at sea require some expertise to operate at a particular depth while knowing the exact location of the cable even if it is only dragging of an anchor, physically damaging the landing point is far easier. The repair time to fix it may be reduced as compared to fixing it at sea, but the effect of disruption would be achieved, nonetheless. It is also important to note that at present Pakistan, neither has the capacity to lay a submarine cable nor to fix it and is reliant on foreign ships/ companies to get the job done.

4.3. **Cyber Threats to MIS** Cyber threats to Maritime infrastructure are not unknown and have happened with great regularity in recent years. They are launched by state and non-state actors in order to achieve their own malicious objectives. The cyber-attack launched on Port of Antwerp in 2011 where hackers gained access to Port of Antwerp's terminal operating system. The culprits had access to each container and what was contained in it and thus started smuggling illicit cargo within those containers which they eventually retrieved physically from the containers as they exactly knew where the container was lying in the container yard. Since nothing else was being stolen, this operation continued for two years till the culprits started to siphon complete containers out of the facility and this operation eventually came to the limelight. Similarly, Russian linked hackers targeted colonial pipeline in 2021 through a ransomware attack and shut down the pipeline which was

used to transport nearly 45% of all fuel on American East Coast. The criticality of the attack can be gauged from the fact that the owners were forced to pay the ransom for operations to resume. Considering Pakistan's nascent growth in cyber defence, any attack on Pakistan's port infrastructure, especially on lines of the Port of Antwerp in 2011, would be a major concern for Pakistan's security agencies. More importantly, Pakistan's Cyber Security Policy 2021 has no mention of any cyber threat to Pakistan's maritime infrastructure (*National Cyber Security Policy 2021*, 2021).

**4.3.1. GPS Spoofing** GPS Spoofing is defined as "*the practice of manipulating or tricking a GPS receiver by broadcasting false GPS signals*" (*What Is GPS Spoofing?*, n.d.). It undermines the quality of GPS data and since the data is being utilized in various applications such as navigation and time synchronization, this specific form of cyber attack becomes very critical in nature. Merchant ships are increasingly reliant on technologies and with the advent of semi-autonomous and autonomous shipping, the global positioning system (GPS) has become even more important. Whether the service provider is American Navstar GPS, Russian GLONASS, Chinese BeiDou or European Galileo, all the GPS data provisioning companies work on a similar technological foundation. The seizure of Stena Impero by Iranian authorities in 2019 in Strait of Hormuz was also linked to GPS spoofing similar to what was faced by around 53 merchant ships which were relocated during a Russian military exercise in Black Sea in 2017 (Bockmann, 2019). It is a similar technology that was previously employed by the Iranians against an American UAV RQ-170 in 2011, when it was spoofed into landing at an Iranian facility rather than Kandahar in Afghanistan (*US Spy Drone 'tricked' into Iran Landing by GPS Spoofing*, 2011).

With Strait of Hormuz in close proximity to Pakistan, the threat of GPS spoofing on merchant ships transiting in waters in Pakistan's area of responsibility (AOR) is menacing and requires careful handling. For merchant ships, it is important that correct GPS data remains available so as to ensure maritime safety as well as they do not impinge upon the sovereignty of any state. A similar threat exists to the fishing community which is out at sea in large numbers and now increasingly reliant on GPS data for navigational purposes. The maritime boundary between India and Pakistan has not been demarcated due Sir Creek issue, and fishermen from both sides continue to fish in the disputed waters in order to get a better catch. Fishermen on both sides of the disputed maritime boundary get caught by respective security agencies and linger in jails. It also raises concern of false flag operations by India in order to malign Pakistan.

## 5. Factors contributing to exploitation of Hybrid Threats

5.1. **Lack of Policy Guidelines:** Pakistan's Merchant Marine Policy was initially issued in 2001 and was re-issued with minor amendments and extending it to 2030. The failure of the policy can be gauged from the fact that no new investment has come in the Shipping sector i.e. no new merchant ship in the private sector has been registered to date. The first right of refusal reserved for PNSC for POL import is also a deterrent against private investment in maritime sector. Similarly, lack of federal control of maritime resources within territorial waters after passage of 18<sup>th</sup> constitutional amendment has stretched the provincial government resources. Provincial sea blindness was even more evident with the lack of capacity to handle issues in the maritime domain. This lack of capacity and political will poses the biggest 'Hybrid Threat' to Pakistan's MIS. The ship recycling business is one example that requires federal and provincial laws to be amended in order to bring them in line with Hong Kong Convention (HKC) that has come into force on 26 June 2025. The federal/ provincial laws have not yet been suitably amended. This means that the yards are unprepared to follow HKC guidelines and forces ship owners to sell ships to ship recycling yards conforming to HKC. This would be a disaster for the businesses that are actively involved in ship recycling business and also for the steel industry that is reliant on the steel retrieved from breaking down ships (Shahid, 2024).

5.2. **Policing at Sea:** Pakistan's fishing sector provides directly supports around 400000 people and around one million are indirectly linked to the fishing sector. But the fishing sector has suffered due to poor regulation, health and environmental concerns, and more importantly multifaceted command structures distributed between federal and two provincial governments. Pakistan Maritime Security Agency (PMSA) is a federal organization tasked with ensuring Search and Rescue (SAR), Marine Pollution Control, Anti-Poaching, Anti-Smuggling and Drug Trafficking operations with regular patrolling and surveillance of Pakistan EEZ. But the allocation of 12 NM territorial waters to provinces, i.e. Sindh and Baluchistan mean PMSA is dependent on policing powers to be authorized by the provincial government to ensure discipline in provincial waters. This creates complexity for the various federal government agencies who are to ensure that marine resources are not always exploited and remain protected. Over fishing aided by zero mesh size nets has depleted the off shore stocks of various fish species whereby most of the caught fish is used for chicken feed (Muhammad Faizan, 2022). Over fishing and fishing in waters of the neighbouring province has resulted in protests by fishermen from Baluchistan and Sindh over trespassing by the other in the provincial waters (*Karachi-Based Fishermen Go on Strike against Balochistan Govt*, 2021).

### 5.3. Poor Economic Conditions of Maritime Sector Employees

The poor economic condition of the fishermen community further

aggravates the situation where the spiral of poverty is unending due to lack of basic amenities such as health and education. This forces the fishermen to sell their stock to middlemen as ascertained by a study undertaken by Engro-WWF which highlighted that 80% and 70% of fishermen in the fishing villages of Ibrahim Hyderi and Rehri sell their catch to middlemen. It also indicated that more than 20% of their catch was spoilt by the time they reached ashore. The study also highlighted a grave concern over the reduced income in non-fishing months of May-August (*Socio Economic Baseline Report 2016-17*, n.d.). The lack of employment during off month is a considerable concern as poor economic conditions can be exploited by VNSAs and terrorist organizations to employ such personnel for their ulterior motives. This is in addition to lack of technological ingress in preserving fish onboard and poor hygienic conditions once brought ashore coupled with the concept of Ghato System<sup>2</sup> has strangulated the development of fisheries sector (Faizan, 2022). As UN Secretary General António Guterres said (Guterres, 2017): "*Terrorism thrives when disenfranchised people meet nothing but indifference and nihilism*"

## 6. Pakistan's Response

Pakistan has been aware of the traditional and non-traditional threats out at sea and has made various efforts to cater for them. But the high cost of modern technology, geopolitical concerns and economic situation has limited Pakistan's access to high end technology and its procurement. Thus, Pakistan's response has been primarily led by Pakistan Navy which has provided the necessary resources from its limited kitty in order to deter these threats. Pakistan Navy has been a member of Coalition Maritime Forces with its HQ in Bahrain since its inception in 2001. Such measures improve coordination with various extra regional forces operating in the region. Pakistan has also undertaken various independent patrols in the region under the ambit of Regional Maritime Security Patrol (RMSP) in Gulf of Oman, Persian Gulf, Gulf of Aden and Red Sea region. It regularly conducts exercises with various neighbouring and regional states such as Oman, UAE, Saudi Arabia, Iran to improve coordination mechanisms and operating procedures. Pakistan recently conducted 9<sup>th</sup> edition of AMAN exercises from 7-11 February 2025 with participation from 60 countries in order to formulate a comprehensive response against a myriad of challenges, including terrorism, piracy, drugs & human trafficking, issues that are no longer limited to the confines of a state and require a unified response ( Shahid, 2024). More recently, Pakistan and Saudi Arabia undertook a live weapon firing exercise on 14 February 2025 which stands as a hallmark of its effort to improve cooperation between two regional brotherly states (Khan, 2025).

At the domestic level, PN has initiated Joint Maritime Information

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<sup>2</sup> Ghato System is an informal system where fisherman is subordinate and liable to a head or landlord, thus permission of premier is mandatory to participate in any educational or training activity.

Coordination Centre (JMICC) which is designed to collect, collate and share information from domestic agencies while interacting with other regional organizations and stakeholders in order to contribute to a safe and secure maritime environment in the region. It is at present, coordinating with 08 international and 48 national stake holders. But this coordination centre is purely an initiative of the Pakistan Navy with the necessary legislation still in limbo. All coordination is purely voluntary, and prone to delays and miscommunication.

Pakistan Maritime Security Agency (PMSA) is one of the premier security agencies operating out at sea with the mission to “assert and enforce national jurisdiction and sovereignty in all Maritime zones of Pakistan and to protect Pakistan's Maritime interests”. PMSA was established on 1 January 1987 while it was legally covered through PMSA Act passed in 1994 by the National Assembly. PMSA with its limited resources, is to enforce national and international laws, agreements and conventions while preventing unauthorized exploitation of economic resources within the maritime zones. They are the primary Search and Rescue coordinating agency at sea while also providing necessary assistance to prevent marine disasters. (*Pakistan Maritime Security Agency Act, 1994*). However, all these taskings demand a fleet of vessels and aerial platforms manned by a competent crew. Unfortunately, assets wise, PMSA is stretched and has limited number of surface platforms and only 03 Defender Aircrafts. This limited number seriously restricts the achievement of assigned functions especially as PMSA to cover an area roughly 290,000 square kms. In addition to this, PMSA is also responsible for Search and Rescue in a large area that extends up to 840 NM from the coast as assigned by International Maritime Organization (IMO) (*PMSA : Assets / Bases, n.d.*). Presently, PMSA has no UAVs/USVs to undertake requisite surveillance of the AoR.

## 7. Way Forward for Pakistan

Pakistan is in the midst of a poly crises with economic concerns leading all of them. The global geopolitical situation is in a flux with American trade tariffs, its role in the recent Indo-Pakistan and Iran-Israel/ Israel-Palestine conflict and mixed signals towards China & Russia requires a careful examination of the situation while moving forward to mitigate the threats that Pakistan faces especially to in the maritime domain. In order for Pakistan to cater the hybrid threats to Pakistan's MIS, a consolidated approach is required to move forward.

**7.1. Diversification of MIS along the coast.** Pakistan's maritime infrastructure is confined in a small space in and around Karachi mostly. Pakistan's sea trade needs to be diversified from the twin ports in Karachi towards Gwadar for which operationalization of Gwadar Port is essential. For this to happen, it requires an efficient road and rail connectivity with the existing network. To reduce threats and create redundancy, a 'strategic plan' is required to not just develop Gwadar Port as a transnational hub but also as a domestic hub for fuel imports, storage depots and oil pipelines emanating at Gwadar and moving northwards to other areas of Pakistan. Development of multiple SPM at suitable locations on lines of Cynergico SPM near Karachi needs to be

considered to offset the over reliance on Karachi. Similarly, redundancy of Karachi as a communication hub needs to be established at Gwadar/ Jiwani where multiple submarine cables may land connecting Pakistan, Iran, Afghanistan, Tajikistan and China to the world. The connectivity of the neighbouring states would raise the stakes for any entity to deliberately damage the submarine cable.

7.2. **Ship Recycling:** The promulgation of Hong Kong Convention in 2025 has forced Pakistan into a tight corner and businesses in India, Bangladesh, China and Turkiye are evidently well prepared to handle the changes proposed in the convention. It is critical for Pakistan's federal and provincial governments to legislate and enforce laws as per HKC while ensuring the provision of basic amenities such as fresh water, sewerage, treatment of hazardous materials and health care in the ship recycling yards and adjoining localities.

7.3. **Fisheries:** The fisheries sector is one of the most outdated sectors of Pakistan. From decades old boat building techniques to use of forbidden nets and non-availability of technologies to detect fish stocks, poor preservation techniques onboard and equally poor preservation and hygienic condition when ashore prevent exports from Pakistan. Rampant illiteracy compounds the problem. In this respect, it is essential that both Sindh and Baluchistan in coordination with the federal government and Maritime Science and Technology Park (MSTP) strategize the revamping of the whole fishing sector with emphasis on:

- 7.3.1. Improved boat building techniques with modern freezers for preservation of catch.
- 7.3.2. Installation of identification and tracking systems onboard fishing boats of all sizes.
- 7.3.3. Indigenous production of fish sonars for installation on fishing boats through various government research and development institutes and universities.
- 7.3.4. Rehabilitation of all fish harbours include desilting and incorporating proper jetties for berthing of fishing boats while ensuring international environmental standards.
- 7.3.5. Regularization of all fish landing sites along the coast with proper registration mechanism while ensuring involvement of community to police their landing site.
- 7.3.6. Digitalization of all fish harbours indicating arrivals and departures with clear depiction of records of type of fish stock landed/ sold and purchased. The measures should also include daily physical checks on enforcement of health, safety and environmental standards with live camera feed available to government inspectors at all times.
- 7.3.7. Socio-Economic developmental programs for all fishing villages along the coast incorporating education, health and social welfare.

Registration of every family is essential in this regard to ensure provision of requisite facilities to the fishing villages. This should also include a target of improving the literacy rate amongst children to an acceptable 75% within next 3-5 years.

7.4. **Cyber Threats:** Cyber threats to Pakistani Ports and other associated facilities is an existential threat and are a serious concern. In order to cater for threats, it is essential that cyber threats to Pakistan's MIS are considered as a threat at the policy level. PKCERT initiative of the Ministry of IT, Govt of Pakistan is an appreciable initiative that needs to extend to maritime infrastructure, public or private. A cyber security audit whether through PKCERT or registered private companies may be made compulsories for all firms associated with Pakistan's MIS. This would ensure that threats are timely identified and mitigated whereas gaps in cyber security are identified in an earlier time frame. Similarly, efforts in the private sector such as National Centre for Cyber Security (NCSS) may also be advised to incorporate cyber security for maritime infrastructure as one of the core issues that they may address. Similarly, government may task National Institute for Maritime Affairs (NIMA) to coordinate formulation of a policy framework to identify and cater for cyber threats in the maritime domain.

7.5. **Recognition of JMICC and Pakistan Maritime Security Agency (PMSA):** PMSA is the only force at sea that has the powers to police and make subsequent arrests. In order to ensure policing of the AoR in a sustainable and cost effective manner, it is essential that PMSA is equipped with Medium Altitude Long Endurance (MALE) UAVs that can ensure suitable coverage of the AoR. The federal government, through various research agencies may also consider manufacturing of Uncrewed Surface Vehicles (USVs) to augment the PMSA fleet. PMSA also requires assistance from provincial government departments who must ensure that registration processes for the fishing boats are duly completed, verified and reported to PMSA for verification at sea. To improve coordination between various government departments and private sector, it is essential that the mechanism of JMICC is brought under constitutional cover at the earliest. This would ensure better coordination against threats whether national or trans-national, and reduce bureaucratic hurdles that limit cooperation between multiple government departments. It is also important that PMSA and Pakistan Coast Guard (PCG) remain within the confines of their responsibilities assigned to them through acts of Parliament.

## **8. Conclusion**

The criticality of MIS for any state cannot be overlooked. Pakistan, a country of 230 million people dependent heavily on two co-located ports needs a consolidated and coordinated approach to counter the hybrid threats that are presently threatening its maritime infrastructure. It is essential that Pakistan looks inward and fixes the problems that are being exploited by hybrid actors and impacting Pakistan's national

security. With mounting concerns of cross border terrorism, political instability and economic meltdown, Pakistan remains in a perpetual state of war. It is paramount that policy frameworks are drawn and implemented in good faith while ensuring that the coastal communities accrue maximum benefits from the socio-economic development. As General Douglas MacArthur once said: "*New conditions and new weapons require new and imaginative methods for solution and application. Wars are never won in the past*" (MacArthur, n.d.)

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