Indian Naval Modernization- 2030:
Challenges and Options for Pakistan

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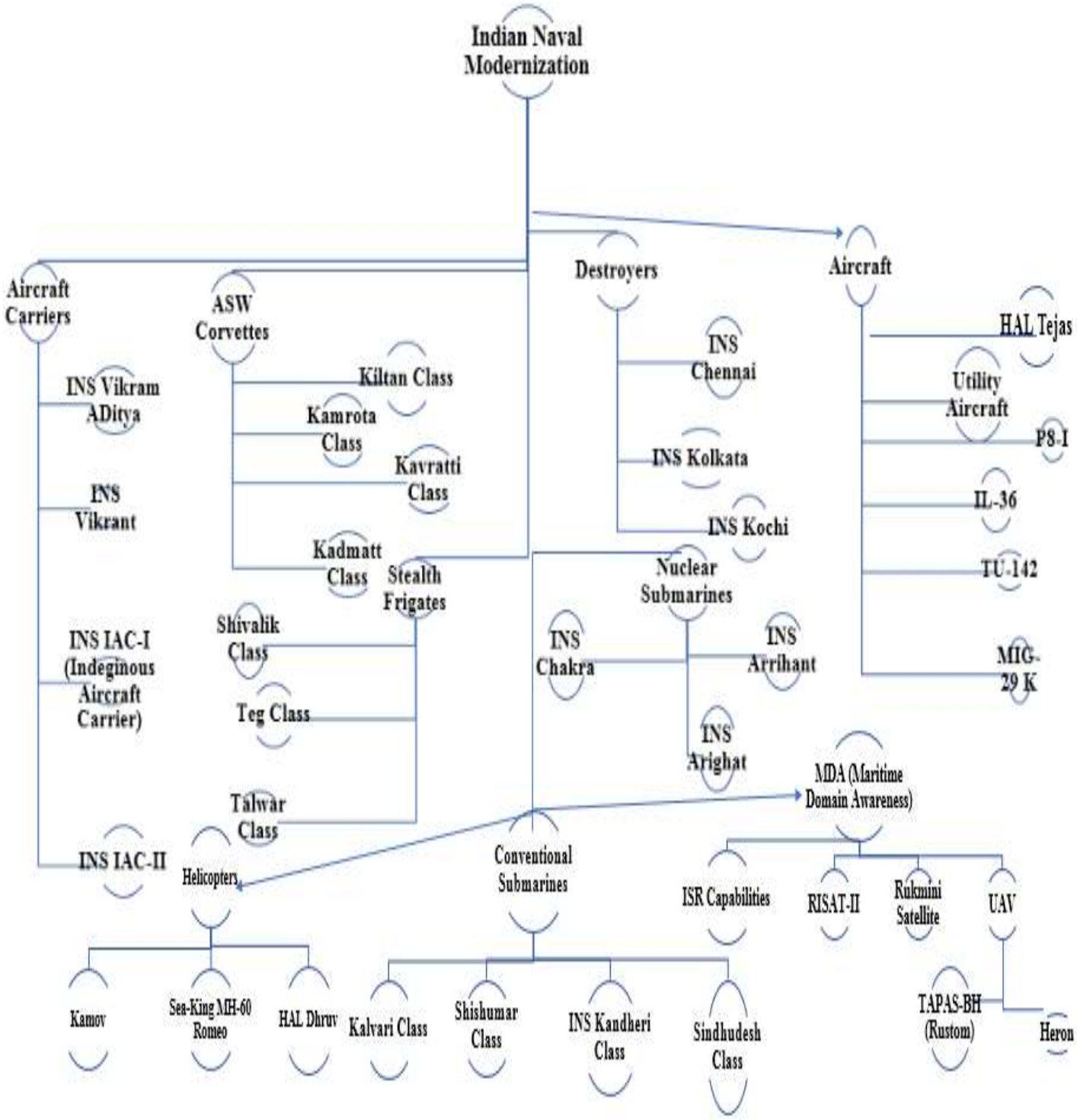
Abstract

The Indian Naval modernization is taking place rapidly to maintain its maritime interests in the Indian Ocean Region and beyond. The purpose is to assert its dominance in the region to deter China and Pakistan from any meaningful role in the Indian Ocean Regions. The Indian Navy is revamping its overall capabilities at sea. Though Pakistan is a credible nuclear weapon state at the same time, there are certain areas where it has to take some concrete steps to counter the Indian assertiveness in the maritime domain. The Indian Navy's nuclear submarines, maritime domain awareness capabilities i.e. P8I, Rukmini Spy Satellite, Surveillance helicopters, modern frigates, anti-submarine warfare Corvettes, and advance destroyers would pose a serious challenge to Pakistan's maritime interests. This article deals with the Indian Navy's doctrinal transformation & weapon acquisitions in for the next decade and its implications of Pakistan's maritime interests.

1. Introduction

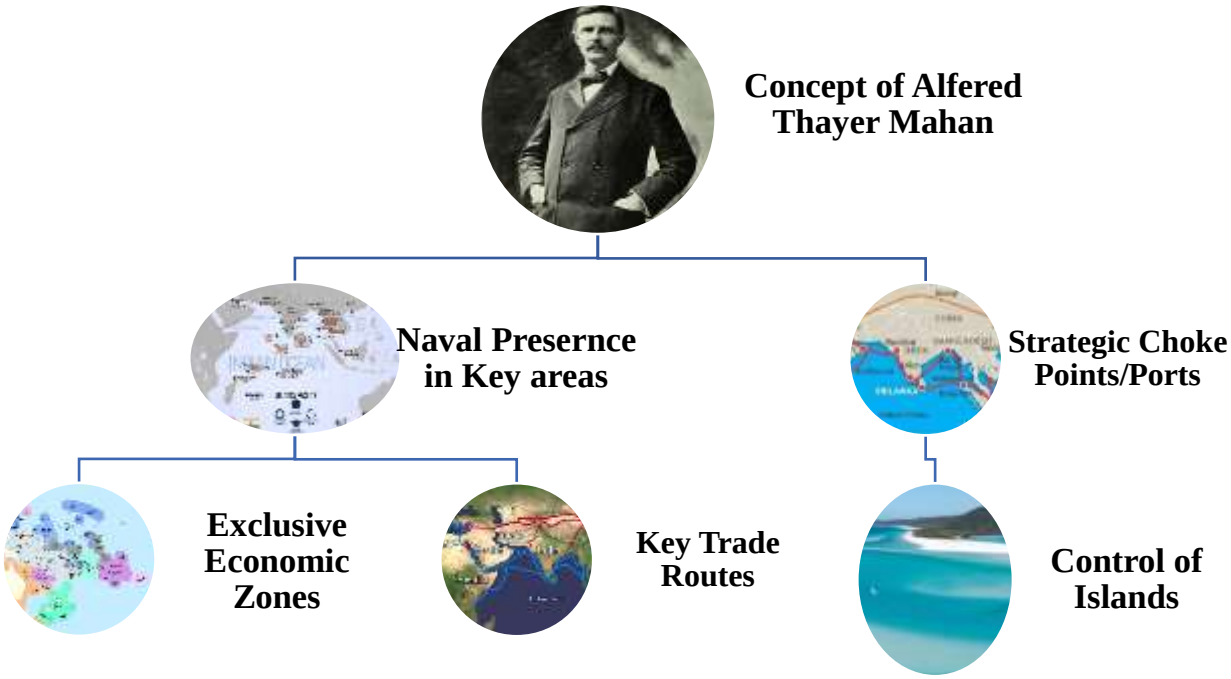
The Indian Naval modernization and doctrinal transformation are on a rapid scale and may create a serious security dilemma for Pakistan. The Indian Naval expansion in the Indian Ocean Region- (IOR) will impact Pakistan's maritime interests in the region. Both countries have been involved against each other since 1947 and strive for dominance in South Asia. Both have also fought three major wars and a small-scale skirmish at Kargil 1999. Pakistan checkmated the Indian Army and Air Force after 2004 on different occasions. Especially, the Indian army's cold start doctrine was neutralized by Pakistan in 2011 with Tactical Nuclear Weapons- (TNWs) and established conventional deterrence

Figure-I



Source: ***Authors Own description***

2. Theoretical Setting- *Alfred Thayer Mahan*



India's maritime strategy is dominated by the Mahan's notion of three volumes of "Sea Power upon history". A great naval strategic thinker and historian noted one century ago about Indian Ocean Region (IOR) that whoever achieves supremacy in IOR would be the influential and dominant player in the international arena. With the gradual passage of time element national power which is Sea Power resulted in the transformation of states' strategic thinking. He opined that a strong navy leads to the national prosperity of the country through protecting shipping and maritime traffic along with dealing with external threats with the help of Naval power expansion economic expansion. In 1860 he was envisaging isolationist policy for the United States of America and then in the 1890's Mahan reiterated that the US should expand itself across the world with unmatched zeal and except naval expansion US has no future. According to the Mahan's Doctrine included three core secrets for US hegemony (Kennedy, 2022, p. 15-20) "(a). Control of the Sea is compulsory for power transformation to Global Power status, (c) The way to sustain as a global power is through having strong Naval Power''.

For example, the United States of America deployed its naval forces all around Eurasia which cover the coastal area comprises of 4,800 miles and a massive of 2.54 million square miles Exclusive economic zone is pushing India toward naval modernization and according to the Indian maritime strategy 2004, the arc from the Persian Gulf to the Strait of Malacca is identified as a legitimate area of IN's interest (Pant, 2016, p. 28-30).

The Indian Navy released an official document in 2015 which delineated the name as Ensuring Secure Seas: Indian Maritime Security Strategy (IMSS). While in contrary to it, the Indian Navy also published a 2007 maritime strategy by delineating freedom to use Seas: Indian Maritime Security strategy, the new document highlighted more assertiveness of the Indian Navy towards ruling the Indian Ocean Regions in over the next ten-year e.g IMMS 2015 (Chaudhury, 2015). The Indian Chief of Naval Staff Admiral Suresh Mehta already indicated in 2008 that in 2020 IN's aspiration to expand across the IOR would be capable of conduction constabulary tasks and would be able to influence the amphibious battles in IOR. Now in 2020 IN is reflecting words predicted by Chief Admiral as IN has inducted and is inducting modern and advance technology under its MDA (Maritime Domain Awareness) (Pant, 2016, p. 30).

To protect resources in IOR like Sea Lanes of Communications (SLOCs), strategic chokepoints, exclusive economic zones, and key trade routes, a. To protect the SLOCs Indian Navy expanding its naval forces along with Indonesia, Sri Lanka, Maldives, Myanmar, Thailand, and Bangladesh Indian Navy is expanding its naval forces. To attain great power status India is following the Mahan's strategy to the role the ocean to role the world as to attaining the great power status India is building and enhancing its military power which the core feature of the great power status and through power projection all across the world Indian need great military power. In this view, a prominent scholar Ashley envisaged that India's rise to great power status would remain unaccomplished until it attains, built all capability to effectively utilize the military power projection (Pant, 2016, p. 31). India's geopolitical aims of becoming world powers are more explicitly effective as it is highlighted from Indian political leadership's statements and doctrinal policy thinking is transforming into the practical formation is started from IOR and the Pacific Ocean. Indian Former Secretary Shayam Saran reiterated the geopolitical aims of Indian "It is India's neighborhood that holds the key to its emergence as a regional and global power" (Trivedi & Searight, 2018).

3. Indian Naval Modernisation-2030:

- **Aircraft Carriers:** *Sea Power*

The concept of the aircraft carrier is to operate in deep seas way beyond from own coastal areas. It provides a country with greater outreach and a floating base to launch an attack from aircraft. Most of the countries with Aircrafts carriers considered themselves as major powers with global ambitions. The same is the case with India. It also aspires to be a global power with greater outreach in the Indian Ocean region and beyond. The Indian aircraft carrier was used in the 1971 War with Pakistan and the Indian Navy always take this as an extension of Land warfare strategy a pioneer earliest military strategy of the Indian Military (Beng Ho, 2018, p.85). IN inducted first aircraft carrier in 1961 named as Vikrant. Carriers always remained counter piece for the Indian navy although it did not play a key role in the 1965 war. Indian Navy possesses two Aircraft Carriers One Vikramaditya and the second one is INS Vikrant. INS Vikrant comprises of cost 2.2US billion Dollars while Vikramaditya is of 2.9 US Billion Dollar under IN flagship. Both Carriers are designed as "small deck carriers". India seeks to build a force structure based on the nucleus centered of three Aircraft carriers Carrier Battle Group (CBG). While conducting operations each carrier has several frigates, vessels, and destroyers that make CBG and one or two

entities operate as Carrier Task Force (CTF). According to IMSS-2015, each CTF is capable to conduct a full-fledged range of operations under the dimensions of Anti -Surface Warfare (AsW), Anti-Submarine Warfare (ASW), Electronic Warfare, Maritime Strike and Anti-Air Warfare (AAW). In addition to it, it could also be used in amphibious battlefields (Beng Ho, 2018, p. 87).

The Aircraft carriers give Indian Navy an upper edge in IOR due to having the aggressive nature in the maritime domain and following the United States of America. India is planning for modernizing for the lethal more advanced naval capabilities especially Queens of Naval expansion aircraft carriers. Another Indigenous Aircraft Carrier (IAC-I) capable aircraft carrier 37,500 tonnes would be commissioned in IN by 2020 which is an amalgamation of INS Vikrant highlighted by Rear Admiral Sushil Ramsey (retd.). It could embark amalgamated 30 aircraft including Airborne Early Warning (AEW) helicopters, Rotary wing assets KA-31 of STOBAR, and including 30 aircraft. It would operate at a fixed-wing on angled of a flight deck with a 12° to 14° high ski-jumps ((Rear Admiral Ramsay (Retd), 2018). India is moving toward indigenization of its Naval arsenal and has stood up to collaborate with foreign countries to acquire more advance and sophisticated capability but the ramifications of acquiring lethal and advance technology specifically in the navy with the militarizing of IOR could be worse by imposing threat to India's the internal stability/security, could disturb regions stability and could raise question mark upon the sovereignty of the neighboring states like Srilanka, Bangladesh, Maldives and Myanmar who do not have strong coastal navies.

As for as the functions of IN Carriers are concerned then IN needs to be very cautious and do not live under the false illusions that they are having an upper edge in terms of commissioning "Small Deck Carrier" due to credibility and functions. To summarizing the limited functions of both carriers INS Vikrant and Vikramaditya due to having the worst configuration of STOBAR (Short Take-off but Arrested Recovery) capability which allows aircraft to launch via ski Jump. The main crucial part of these functions is that when jet fighters like MiG29 which has a configuration of a short combat radius of about 850 Kilometers if it hovers on internal fuel alone. But if a plane is going take off with this configuration then it would be impossible for the plane to carry out strikes as with additional fuel tanks it can mark up to 1300 Kilometers and carriers function only allow to carry less ordnance and fuel or both in addition to this would also reduce the available number of hard-points particular for ordinance ((Joshi, 2016, p.61). However, in the South Asian strategic milieu, the aircraft carrier holds little significance. It is considered as an elephant of the sea but at the same time, India may not pitch it against Pakistan because of three reasons. First, both states share a huge land border and traditionally both countries focused more on land than sea. Secondly, after the nuclearization of South Asia, India and Pakistan avoided direct conventional clash and it is expected that nuclear deterrence would remain intact. Pakistan's Air-Launched Cruise Missile-(ALCM) Raad which possesses a 600km standoff capability would be a nightmare for the Indian aircraft carrier. Pakistan's Air Former Chief Tahir Rafique Butt said that,

> *"Aircraft carrier is a very potent threat, but it is an extension of power basically, for a country that's your neighbor. To threaten Pakistan India has to keep it away 600 miles away from Pakistan, because we may kill it in two days. It would be national mourning for them, their flag would be on the half*

march that Aircraft carrier has been destroyed. We have weapons that can hit 200 km away. So, I think the aircraft carrier has not much relevance as far as Pakistan is concerned. India doesn't have the capability to carry out our naval blockade on the pattern in 1971. We have very sophisticated anti-ship missiles. (ACM (retd) Tahir Rafique Butt. *(2020).*

Secondly, Pakistan has also developed Babur-3 nuclear-tipped Submarine-launched Cruise Missile- (SLCM) with an approximate range of about 700 km. Pakistan Navy has modified its conventional Agosta Submarine and enabled it to carry a nuclear Babur-3 SLCM which may deter the Indian Navy from any aggressive action at sea. Former Vice Admiral Muhammad Haroon has also indicated that Pakistan's nuclear submarine would take out Indian Aircraft Carrier if they try to make any aggressive maneuvers against Pakistan's maritime interests. He opined,

"It is just projection of power, now they put their nose into the South China Sea where they think they will be able to dominate the Chinese which I don't think so. As far as India and China having a confrontation in the South China Sea, the strategic orientation lies heavily with China, not with India, and that kind of power projection an aircraft carrier carrying 25 aircraft does not make any difference as far as power projection is concerned. However, in the Indian Littoral, it does make an impression. Fine, it would be a good target for our submarines" (M. Haroon Vice-Admiral Pakistan Navy, 2020)

Stealth Frigates- *Enhanced Power:*

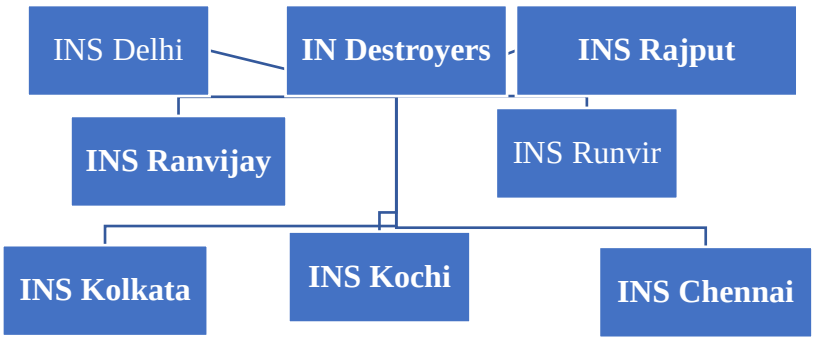
Stealth frigates are force multiplier to IN's. In frigates IN has commissioned frigates including (Shivalik Class, Teg Class, Kamrota Class and Talwar Class.

Project 17A:

Under project 17 Directorate of Naval Design (DND) and Naval Design Bureau was allocated construction of six ships including three multi-role frigates Shivalik Class, INS Satpura, INS Sahyadari (Chand (Retd), 2020). IN incorporated multiple multi-role fighter

indigenous frigates including Shivalik-F17 Class built by Mazagon Deck Mumbai. Shivalik Class also called "Project 17A" stealth capable frigate. INS Shivalik can sail 257 personnel and 35 officers. INS Shivalik is equipped with highly sophisticated and advanced weapon systems including BrahMos (Indian Navy, 2020).

- **Destroyers:** *Greater maneuverability***:**



Flow at sea comes with a greater position. India has indigenous destroyers made under project 1. IN has attained the fastest and advanced stealth destroyers named INS Kochi, Kolkata, and Chennai which are stationed at Kochi, Kolkata, and Chennai respectively. INS Kolkata is the missile guided destroyer. INS Kolkata class is constructed under project P-15 by Mumbai Mazagon Dock and designed by the Navy's Directorate of Naval Design and commissioned on 16th August 2014((Indian Navy, 2020). IN has enhanced its utility of Destroyers constructed under project P-15 through the induction of satellite C4ISR capabilities. Modernization of destroyers could give adverse effects for states who have trade routes and presence in IOR and pacific. There could be serious consequences upon the maritime trade and economy.

India is also having the plans for acquiring lethal and deadly weapons and sensors package for four missile-guided destroyers that are under construction. Cabinet Committee on Security cleared 35,800crores for new indigenous deadly destroyers and for the latest technology weapons CCS cleared 61,500 crores for the acquisition wide range weapons which would be installed upon upcoming indigenous destroyers (Pandit, 2020). Supersonic BrahMos cruise missile developed under the joint cooperation between Russia and India. While Barak missile system developed between the Indian DRDO and Israeli Aerospace industries of Rafael (Pandit, 2020).

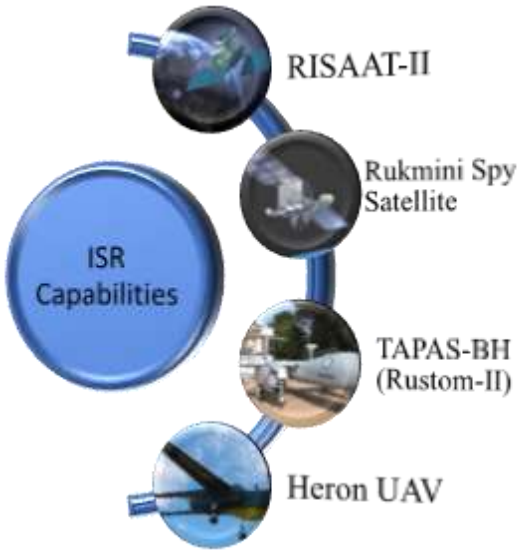
Feature of Four Future Destroyers 2020-30:

Name	Details
Equipped Missiles	1.Supersonic Cruise Missile Brahmos Missile 2. Barak Surface-to-surface Air Missile System
Weight	7,300 tonnes
Equipped Gun	127mm and Rocket Launchers
Equipped Sensors	Latest Technology Sensors

Maritime Domain Awareness:

When it comes to MDA (Maritime Domain Awareness) then IOR contains SLOCS, Ports, Strategic choke points, and Islands, key trade routes. Proper utilization of IOR through MDA, which is a universal requirement in the modern world to run the blue economy in the IOR. MDA deals with modernization related to maritime warships, corvettes, frigates, destroyers, submarines, aircraft and other most significant capabilities in modern days is the space satellite capability for maritime surveillance. MDA requires for utilization of space assets through airpower capabilities in the Maritime domain. Maritime power requires synergistic effects for advanced surveillance. Furthermore, including World's busiest SLOCs, with two-third of the world's shipments of oil, and half the world's container shipping allotment, one-third of huge cargo traffic are significant features of the IOR (Cole, 2013, p. 175). Indian Navy is going to make an integrated and synergized tri-services through utilizing Air and Space power (Indian Ministry of Defence, 2022).

ISR capabilities



- ***Rukmini Spy Satellite:***

  Space capabilities are the force multiplier to IN. To counter emerging threats including human and drug trafficking, SLOCS, early detection of adversary troops, movements of Indian naval troops, naval forces including ships, destroyers, frigates,

and submarines, and to create communications and network-centric warfare capabilities IN must rely upon space capabilities (Indian Express 2017). For the procurement of Radar Satellite capability INR400 million had been invested by ISRO (Indian Space Research Organization. Indian former chief of DRDO (Defense Research and Development Organization) revealed the Indian plans of adding few satellites in Space to fulfill the requirement of Tri-service (Masood Ur Rehman Khattak, 2019, p. 25). One of the Space capabilities that launched in LEO (Low Earth Orbit) in 2009 and 2013 spy satellites named RISAAT -II and an indigenous satellite GSAT-7 Rukmini Spy satellite respectively.

India stepped up in Space right after the Mumbai attacks and launched RISAT-II in 2009 with strategic partner Israel to ensure a check on movement and deployment of troops in IOR and to get information about weather conditions (Hashmi & Khan, 2019, p. 44). In December 2007 Chief of Naval Staff Suresh pointed toward space satellite capability for Navy that the Indian Navy has its dedication towards acquiring broad-band space-based satellite capabilities for dual purposes for advanced network-centric warfare and communications (Mohan, 2009, p. 05). Satellites induction by ISRO would have adverse effects for Pakistan's conventional submarines, Naval facilities including coast guards and naval bases in the Arabian Sea as India can easily pose a threat to Pakistan Navy.

- **UAVs:** Indian Navy is also enhancing its UAVs capabilities by getting from the USA for maritime surveillance. Unmanned Aerial System great significance especially for the Indian Navy either in the Pacific Ocean or IOR. Indian armed forces have acquired and operating UAVs over a decade. Indian armament modernization paved a way for Indian Armed forces to achieve and acquired modern tech weaponry. According to Government Sources IN is opted to procure Sea Guardians drones from US-made UAVs on urgent bases to enhance the surveillance and reconnaissance activities at sea. And IN is also opting to upgrade existing UAVs. In addition to this, a proposal has been moved on fast track bases which include the purchase of 10 Naval shipborne Unmanned Aerial systems for over 1,240 crores (Achus, 2020).

  IN has Heron UAVs which are suited for ashore requirements. Israeli made Heron UAV gives Indian Navy as upper due to having an unleashed endurance of 45 hours. Indian Department of Defense Production is also going to develop UAV Medium Altitude Long Endurance (MALE) TAPAS-BH with and endurance time of 24 hours to carry out ISR (Intelligence Surveillance Reconnaissance) operations role for tri-services. It is designed in 2018 and its test trials were taken under 50 flight trials in total using airframes of AF5 in 2018 and 9 flight trials using airframes of AF6 in 2019 (MOD India, 2022).

Future Plans of IN for Upgradation of UAVs:

According to the Indian Ministry of Defense to protect the country's areas of interest from the Strait of Malacca to Madagascar IN has a keen desire to upgrade its existing three drones.IN is purchasing 10 surveillance drones to monitor the Chinese movement in IOR through deploying these drones upon naval warships. Later, IN received two variants of Searcher MK-II and more capable Heron than IAI MALAT in December 2012. Besides another existing drone Sea Guardian from the USA. In 2020, IN have upgraded its existing drones. While others are on their way. (Negi, 2020)

Indian Naval Air Forces: IN air forces have a huge impact upon the stability of IOR and to maritime interests of States which have their trade and choke points in IOR states like China and Pakistan. According to the
Global Security Index, the Indian Navy has numbers of Air Forces from ASW aircraft to utility Helicopters to ASW Choppers and upcoming helicopters an aircraft which are given below in the figure (Pike, 2021).

Helicopters:

Indian Navy is inducting the latest choppers including helicopters equipped with the latest weapon systems and latest ISR capabilities. Modernization of helicopter with a reflection of doctrinal transformation into action is very deadly for the states which have their interests aligned in IOR especially for China and Pakistan.

Indian Navy is moving toward acquiring state of art technology 24 Helicopters MH60-Romeo from US company Lockheed Martin at a cost of USD 2.6 billion. MH60R is designed for anti-submarine warfare; for ASW missions it is equipped with AGM-114 hellfire anti-surface missiles, a precision kill weapon system, and

MK-54 heavy torpedoes with 7.62mm machine gun. To detect submarines at a long-range it is well equipped with Radars and sensors through Raytheon Airborne frequency with dipping sonar inside the very deep sea (The Economic Times, 2020). The package was announced by the Department of defense USA in April 2019. It can easily intercept ships, submarine, or any adversary's target at a range of 185 Kilometers (Som, 2020)

Specifications of MH60R (Som, 2020):

Name	Details
Climb rate	8.38m/s
Maximum Cruise Speed	267km/h
Range	834 kilometers
Service ceiling	3,438 meters
Weight	6,89 5 kilograms
Maximum take-off weight:	10,659 kilograms

Another with unleashed and well-equipped Russian state of Art technology Helicopter has its significance in the Indian navy from 1999 to till present due to its capability of detecting threats, surveillance, targeting and transmission of target data have a huge impact upon adversary's capabilities. It will be deployed upon INS Virat Aircraft Carrier and with three Talwar Class frigates which have been bought from Russia. It could operate at land as well ("Ka-31 Radar Picket Airborne Early Warning (AEW) Helicopter," 2019).

One can say it as an amphibious copter. It is tuned with early warning Radar. Its salient features are hereby following as:

Ka-31 Radar Picket Airborne Early Warning (AEW) Helicopter

Name	Details
Crew	2 Pilot
Overall Length	12.5m
Overall Body Length	11.25m
Height	5.6
Early Warning Radar	E-801 Oko (Eye)
Radar's Surveillance Range	100km-200km with simultaneously target tracking.
Operating Altitude	3,500m
Maximum Take-off Weight	12,200Kgs
Flying Speed	100km/h
Engine Horsepower	1,633W with two Klimov TV3-117VMAR each

- **Surveillance aircraft:**

P8-I aircraft: P8-I is designed to enhance anti-submarine warfare and Intelligence and surveillance capabilities. P8-I is one of the best Aircraft Indian Navy got. Indian has ordered approximately 22 aircraft from Boing. It is used for ISR purposes. It is multi missioned aircraft ("21st Century Maritime Security for the Indian Navy," 2017). It is going to detect aerial threats, inform command centers in time, and in the meantime and countermeasures could be taken against threats. It has a significant role against surface threats. For instance, if any surface ship, frigate, corvettes, or any threat through surface approaching Indian territory it can deal with that easily. Another important key function of P8-I is that it can detect sub-surface threats like underwater submarines. Furthermore, Submarines are the backbone of any country or any naval force. It counters sub-surface threats by taking out depth charges, torpedoes, or through anti-submarine missiles also. Once India achieves aircraft like P8-I into its Naval Forces it would be adverse for Pakistan. It is going to affect seriously Pakistan's conventional Submarines Capability for example Pakistan is having an Agosta-90B submarine.

Recently, Pakistan detected Indian Scorpene-Class Submarine twice in 2016 and 2019 with PC3 Orion Aircraft. PC3 Orion is the classic version of the P8-I, while P8-I is highly sophisticated with greater range and high precision and surveillance capabilities and greater outreach in IOR ("P-3C vs. P-8I: India, Pakistan and the naval balance," 2020). And such type of capabilities would give India certainly an edge to MDA (Maritime Domain Awareness). Pakistan must take some countermeasures against Indian naval modernizing capability.

> *"Yes, it would impact on our Maritimes assets. I am a submariner; I have served 18 years in submarines. I have commanded three submarines I have commanded the submarine fleet. There are methods, procedures, how to evade such a system however while we say the P8-I is probably being a good system, it has its limitations as well for example it would be difficult for it to fly low. The P8-I has jet engines, which makes you quicker, faster that is the advantage as well was limitations"* (Muhammad Vice-Admiral Pakistan Navy, 2020).

General Features ("21st Century Maritime Security for the Indian Navy," 2017):

Name	Details
Propulsion:	**Two CFM56-7 engines delivering 27,300 pounds thrust to each**
Length	**39.47 meters**

Wingspan	**37.64 meters**
Height	**12.83 meters**
Maximum Takeoff Gross Weight	**85,139 KGs**
Speed	**490 knots (789 km/h)**
Range	**1,200+ nm, with 4 hours on base (2,222 kilometers)**
Ceiling	**12,496 meters**
Crew:	**9**

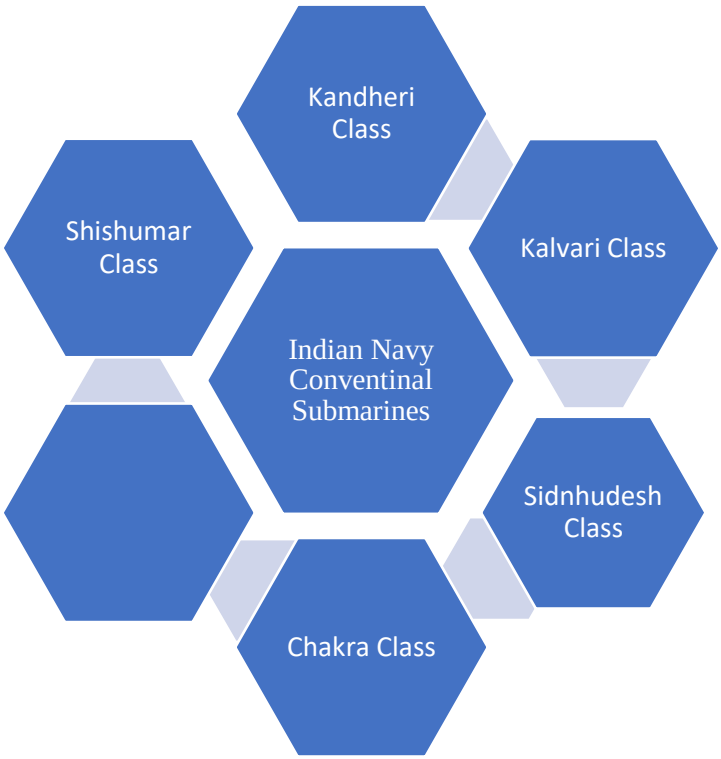
Nuclear Submarines: *Second Strike Capability:*

To discuss India's SSBNs (Submarine Submersible Ballistic Missile Nuclear Powered) are going to pose serious threats to IOR and strategic stability of South Asia in general and particular for Pakistan. After the acquisition of assured second-strike capability, the Indian Navy has become more acting in an aggressive mode. Indian is trying to build its state-of-the-art nuclear-Powered Submarine Capabilities to counter the vis-à-vis threat from Pakistan and China. Yogesh and O'Donnell investigated in their book that according to the Indian Nuclear posture of 2017 that India had achieved, it has achieved technical knowledge and nuclear means along with Seaborn nuclear-armed submarine fleets (Joshi & O'Donnell, 2018, see chapter one). Addition to it, India has already approved for the build of six nuclear Powered at Ship Building Centre Vishakhapatnam (SBC) and India achieved 2nd strike capability in 2016 by inducting ATV (Advanced Technology Vehicle) INS (Indian Nuclear Submarine) Arihant and completed its triad.

INS Arihant with its lethal destructive capabilities has multi-missioned and highly equipped with advanced weapons including Submarine Launch Ballistic Missile (SLBM) *Sagarika (K-15) having a range of more than 700 Km and versions of Nuclear capable Nirbhay Cruise missile (H. Foye 2022).*

The ramifications of the acquisition of SSBNs by the Indian Navy could pose adverse effects for Pakistan due to the endurance of strategic outreach including range, and lethality of firepower. Stealth capabilities and INS could serve the purpose of Assured second-strike capability (Dr. Masood Khattak, 2018).

Conventional Submarines: *Greater Outreach*



Indian Navy is shifting toward building and enhancing naval capabilities especially through the induction of submarines. Although, India has already a sufficient naval arsenal to protect its coastline along IOR. Power projection and geopolitical goals of India are playing as a catalyst in the Naval arms race and conventional submarines are one of them. Currently, there are 14 operational conventional submarines and to nuclear-powered Submarines in the possession of the Indian Navy. Indian Navy's fleets are stationed at Mumbai on the west coast and Vishakhapatnam on the east coast (Nuclear Threat Initiative, 2019).

Conventional submarines including Kalvari class and Shishumar-class diesel-electric submarines. Indian Navy collaborated with Germany's Thyssen Krupp Marine Systems (TKMS) to upgrade the two of four Shishumar-Class diesel-electric attack submarines. India has four operational Shishumar class submarines under IN. This German submarine has lethal attacking capabilities to counter adversary's conventional submarines. Its first two vessels were designed and constructed by Howaldtswerke-Deutsche Werft (HDW) in Germany. While the rest of the third and fourth were constructed in Mumbai at Mazagon Dock through a package supplied by KDW (VAYU (IAI), 2020). This submarine has unleashed submerged capabilities as it can remain underwater for 50 days without surfing.

It can travel 225 knots with its 8-meter-wide and 65-meter-long beam. India is now going to start bidding to procure 6 submarines costing up to 55,000 crores and domestic manufacturers defense companies would participate in bidding and India has requested proposals for its mega project named P-75 which is completed and would be issued in October 2020. (Indian Air and Defence Review, 2020).

Conclusion

The Indian Naval modernization and doctrinal transformation would have far-reaching implications for the Pakistan Navy. Pakistan Navy must reevaluate its strategic approach in the Indian Ocean Region to protect its maritime interests efficiently. Though Pakistan Navy is a coastal navy that is competent enough in ensuring the security of its maritime boundaries and an exclusive economic zone at the same, it must be cognizant of the fact that massive naval buildup by India would threaten the long term interests of Pakistan in this region. Pakistan Navy must identify the weak areas and start working on them to deter any aggressive moves by the Indian Navy. As far as the aircraft carrier is concerned, that is not posing any considerable threat because of the obvious reasons. Pakistan is a nuclear weapon state with SLCMs and ALCMs which would deter the Indian elephant at sea. However, there are certain areas where the Indian Navy enjoys superiority to some extent. i.e the induction of five or six nuclear submarines in the future would give the Indian Navy second-strike capability at sea, which could be used to deter Pakistan's first use option. Such a capability would definitely provide the Indian Navy an edge vis-à-vis Pakistan and may create a gap for any limited incursions under the new land warfare doctrine of 2018. Pakistan must focus on maritime domain awareness capabilities to locate, identify, deter, and protect its short but significant maritime boundaries from any aggressive maneuvers at sea. Pakistan must invest in long-range reconnaissance and observation systems to identify incoming aerial- (aircraft, missiles, UAVs, etc), surface- (frigates, corvettes, destroyers, etc) and subsurface- (conventional & Nuclear submarines) threats.

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