



Significance of Carrier Aviation

For Prelims: [INS Vikrant](#), [INS Vikramaditya](#), [Indian Ocean region](#), [Indo-Pak War 1971](#), Defence Public Sector Units, SRIJAN Portal, Project 75I, Defence Procurement Policy

For Mains: Key features of INS Vikrant, Significance of aircraft carriers in India's Maritime Security

[Source: TH](#)

Why in News?

Recently, the Indian Navy's two aircraft carriers, **INS Vikramaditya** and **INS Vikrant**, demonstrated "twin carrier operations," featuring simultaneous take-offs of MiG-29K fighter jets from both carriers, followed by cross-deck landings, underscoring a capability possessed by only a select few nations.

What are the Key Features of Indian Aircraft Carriers?

- India boasts **two operational aircraft carriers**, each with a rich history and unique capabilities.
- **Origin:**
 - [INS Vikrant](#) is the **first domestically built** aircraft carrier boasting **76% indigenous content**. It was constructed at **Cochin Shipyard Limited**, it's a symbol of India's growing shipbuilding prowess.
 - On the other hand, **INS Vikramaditya** is a **modified Kiev-class carrier**, originally built for the Soviet Navy. After extensive refitting and modernisation, it was inducted into the Indian Navy in 2013.
- **Size and Speed:**
 - **INS Vikrant** weighs around **43,000 tonnes and 262 meters long**. Its design **prioritises manoeuvrability** with a **top speed of 28 knots**.
 - Whereas, **INS Vikramaditya** is slightly larger, weighs around **44,500 tonnes** and a **length of 284 meters**. It can reach speeds of up to **30 knots**.
- **Firepower and Flexibility:**
 - **Both carry a similar arsenal of aircraft**, including [MiG-29K fighter jets](#) for air defense and ground attack, **Kamov-31 helicopters** for airborne early warning, [MH-60R helicopters](#) for multi-role operations, and indigenously built Advanced Light Helicopters (ALH) for utility tasks.
- **Modernity and Innovation:**
 - **INS Vikrant** incorporates the latest advancements in design, sensors, and electronics. It boasts a new combat management system, potentially offering superior situational awareness and operational efficiency.
 - **INS Vikrant** ensures precision operations even in adverse conditions by utilising the **STOBAR (Short Take-Off but Arrested Recovery) method**.
 - Whereas modernised, **INS Vikramaditya** still uses older technology.
- **India's Future Plans:**
 - India is planning to have **four aircraft carrier battle groups (CBGs)** instead of three to strengthen its naval presence.

- The **Indian Navy's 15-year plan** includes four fleet carriers and two light fleet carriers.
- The new indigenous aircraft carrier **INS Vishal**, also known as Indigenous Aircraft Carrier 3 (IAC-3), will be built at the **Cochin Shipyard**, similar to INS Vikrant.

// Naval forces in the Indo-Pacific Carriers and Submarines by Country

| Country | Aircraft Carriers | Helicopter Carrier | Submarines |
|---------------|-------------------|--------------------|------------|
| United States | 11 | 9 | 68 |
| China | 3 | 3 | 72 |
| India | 2 | 0 | 16 |
| South Korea | 0 | 2 | 18 |
| Japan | 0 | 4 | 22 |
| Australia | 0 | 2 | 6 |
| Taiwan | 0 | 0 | 4 |

Debate on Aircraft Carriers vs Submarines

- A debate has emerged among navies on whether to focus on submarines or aircraft carriers due to technological developments.
- **Technological developments** such as anti-ship missiles, hypersonic missiles, and new anti-aircraft systems have raised concerns about the **vulnerability of aircraft carriers**.
- The **economic costs of aircraft carriers are huge**, limiting the ability of many countries to operate both submarines and carriers.
- Submarines are seen as a better alternative due to their **stealth advantage** and **relatively cheaper cost** compared to aircraft carriers.

INS VIKRANT REBORN

India's First Indigenously-Built Aircraft Carrier

DID YOU KNOW?

- Flight deck is the size of two football grounds
- 8 power generators enough to light up Kochi city

VITAL STATS

₹20,000 Crore

Cost

45,000 tonnes

Weight

262 metres

Length

62 metres

Width

28 knots

Top Speed

2,300

Compartments

1,700

Crew Strength

AIR POWER TO BE DEPLOYED



MiG-29K
Fighter Jets

(Image Source: US Navy)



Kamov-31
Helicopters

(Image Source: Indian Navy)



MH-60R Multi-role
Helicopters

(Image Source: US Navy)

TOP FEATURES

- First aircraft carrier to be constructed in India
- Largest warship to be built in India
- Has capacity to operate 30 aircraft
- 15 decks, multi-speciality hospital, pool
- Specialised cabins for women officers

What are the Challenges Associated with Indigenisation of Aircraft Carriers?

▪ Technological Complexity:

- Building an aircraft carrier involves integrating numerous advanced technologies from propulsion systems to combat management and aviation facilities.
 - India initially planned for a **catapult launch system (CATOBAR)** but later switched to a **ski-jump launch with arrested recovery (STOBAR)** due to technological limitations. While STOBAR is a proven system, it limits the operational capabilities of heavier, more advanced aircraft.

▪ Time-Consuming Process and High Cost Burden:

- Designing, procuring materials, and constructing a complex warship like an aircraft carrier is a time-consuming process. Delays can **impact overall costs and strategic planning**.
 - The design work for INS Vikrant began in 1999, but the carrier wasn't commissioned until 2023 – a delay of over two decades.
 - This **extended timeline** can also lead to technological advancements rendering some aspects of the carrier obsolete even before its completion.
- Building an aircraft carrier is an **expensive** undertaking, requiring significant investment in materials, labour, and specialised technologies.

▪ Skilled Manpower and Industrial Base:

- Constructing an aircraft carrier necessitates a large pool of skilled workers with expertise in various disciplines.
 - India had to rely on **foreign expertise and technology** transfer for certain aspects of **INS Vikrant's** construction, highlighting the need for further development of its domestic shipbuilding industry.

▪ **Material Dependence:**

- Even with an indigenous design, some critical materials and components might still need to be imported, creating a **reliance on foreign suppliers**.
 - Although INS Vikrant boasts a high percentage of indigenous content, some key elements like high-tensile steel and specialised electronics might have been sourced internationally. This can create vulnerabilities in times of geopolitical tensions.

What is the Significance of Carrier Aviation for India in Modern Strategic Terms?

▪ **Supporting Land and Air Operations:**

- In the context of the ongoing disputes along India's land boundaries, the potential for border conflicts persists, emphasising the strategic advantage robust aircraft carriers would provide in future conflicts.
 - During the [1971 operations for the liberation of Bangladesh](#), INS Vikrant's aircraft played a crucial role in striking deep into East Pakistan, highlighting its strategic significance in supporting land battles.

▪ **Maintaining Security of Sea-Lines of Communication:**

- In times of military conflict, an **aircraft carrier serves as the primary naval asset** capable of comprehensively protecting merchant shipping routes vital for carrying strategic commodities to India.
 - Concerns have been raised regarding the **vulnerability of energy imports through the Strait of Hormuz** due to **China's strategic presence** in Pakistan's Gwadar port, underscoring the importance of carriers in safeguarding sea-lines of communication.

▪ **Ensuring Presence in the Indian Ocean Region (IOR):**

- India's security interests are intricately linked to the [Indian Ocean and its surrounding littoral region](#), where the presence of Chinese strategic assets poses challenges to India's influence.
 - An aircraft carrier enables India to assert its influence in these waters and deter potential threats from extra-regional powers, thereby safeguarding its interests in the IOR.

▪ **Protection of Important Overseas Interests:**

- Carrier aviation provides India with the capability to safeguard its strategic interests overseas, particularly in **Afro-Asian states facing political, socio-economic, and ethnic instabilities**.
 - India's economic and strategic stakes are increasing in these regions, necessitating the ability to respond effectively to emerging threats and protect its citizens and assets abroad.

▪ **Securing Island Territories:**

- Integral naval aviation is essential for defending India's remote island territories, such as the Andaman and Nicobar Islands, which are **vulnerable due to their geographical spread** and limited infrastructure.
 - The presence of an [aircraft carrier](#) serves as a **deterrent** against potential foreign military occupation or claims, ensuring the security of these strategically important territories.

▪ **Other Non-Military Missions:**

- Beyond its military role, an aircraft carrier significantly expands India's operational capabilities to **respond to natural disasters in regional seas** or littoral areas.
- With its capacity akin to a floating city, a carrier can provide essential services and logistical support, **complementing existing sealift platforms** and enhancing India's disaster response capabilities.
- Efforts to incorporate modular concepts further enhance the carrier's versatility for non-military missions, enabling rapid deployment of specialised resources for **specific humanitarian missions**.

What are the Related Initiatives Towards Expanding India's Defence

Infrastructure?

- [Development cum Production Partner Initiative](#)
- [Defence India Startup Challenge](#)
- [SRIJAN Portal](#)
- **Increased the [Foreign Direct Investment \(FDI\)](#) limit in defence sector from 49% to 74%**
- [Innovations for Defence Excellence \(iDEX\)](#)
- [Positive Indigenisation List \(Defence Procurement Policy\)](#)
- [Project 75I](#)

Conclusion

India's focus on indigenous production and ambitious plans for additional carriers demonstrate its commitment to building a future-proof and powerful navy. While the debate between aircraft carriers and submarines continues, India's twin carrier operations showcase its strategic intent to leverage both for a comprehensive maritime defence strategy.

Drishti Mains Question:

Q. Discuss about the key features of Indian aircraft carriers. Also, mention the significance of carrier aviation for India in modern strategic terms.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Q.1 Which one of the following is the best description of 'INS Astradharini', that was in the news recently? (2016)

- (a) Amphibious warfare ship
- (b) Nuclear-powered submarine
- (c) Torpedo launch and recovery vessel
- (d) Nuclear-powered aircraft carrier

Ans: (c)

Q.2 Consider the following in respect of Indian Ocean Naval Symposium (IONS): (2017)

1. Inaugural IONS was held in India in 2015 under the chairmanship of the Indian Navy.
2. IONS is a voluntary initiative that seeks to increase maritime co-operation among navies of the littoral states of the Indian Ocean Region.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (b)

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